REPORT RESUMES

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SOCIAL AND PSYCHOLOGICAL PREDICTORS OF INFORMATION SEEKING AND MEDIA USE, A MULTIVARIATE RE-ANALYSIS. REPORT. PAPER PRESENTED AT THE NATIONAL SEMINAR ON ADULT EDUCATION RESEARCH (CHICAGO, FEBRUARY 11-13, 1968).

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USING DATA FROM A STANFORD UNIVERSITY STUDY IN FRESNO, CALIFORNIA, A MULTIVARIATE ANALYSIS WAS MADE OF 25 MEDIA USE AND INFORMATION SEEKING BEHAVIORS. SEVEN SOCIAL-PERSONAL AND THREE PSYCHOLOGICAL VARIABLES WERE ALSO CONSIDERED. YOUNGER ADULTS WERE MOST LIKELY TO PARTICIPATE IN ADULT EDUCATION, ESPECIALLY VOCATIONAL COURSES AND EVENING CLASSES AND USE RADIO FOR MUSIC AND ENTERTAINMENT. OLDER ADULTS WERE THE ONES MOST LIKELY TO READ "READERS' DIGEST" AND RELY ON RADIO FOR INFORMATION. READING OF FICTION BOOKS AND OF DOMESTIC AND FASHION MAGAZINES (WOMEN), AND PARTICIPATION IN ARTS AND CRAFTS COURSES (MEN) AND LIBERAL ARTS (WOMEN) WERE BEST PREDICTED BY SEX. EDUCATION CORRELATED WITH READING OF BOOKS, NEWS MAGAZINES, AND PERIODICALS IN GENERAL AND WITH RECENT PUBLIC LIBRARY USE. INCOME AND EDUCATION WERE STRONG PREDICTORS OF NEWSPAPER USE. RECEPTIVITY TO NEW EDUCATIONAL MEDIA PREDICTED THE USE OF REFERENCE BOOKS, IMPERSONAL INFORMATION SEEKING, AND INDEPENDENT STUDY. MEMBERSHIP IN ORGANIZATIONS CORRELATED CLOSELY WITH INTERPERSONAL INFORMATION SEEKING, AND THE PERCEPTION OF PRACTICAL INFORMATION IN MEDIA WAS RELATED TO USE OF "LIFE" MAGAZINE, SERIOUS TELEVISION PROGRAMS, AND SPECIFIC INFORMATION SEEKING. ACHIEVEMENT MOTIVATION CORRELATED WITH NONFICTION READING. IMPLICATIONS AND ALTERNATIVE APPROACHES WERE SUGGESTED. INCLUDED ARE 52 TABLES AND FIGURES AND 28 REFERENCES. THIS PAPER WAS PRESENTED AT THE NATIONAL SEMINAR ON ADULT EDUCATION RESEARCH, CHICAGO, FEBRUARY 11-13, 1968. (LY)

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SOCIAL AND PSYCHOLOGICAL PREDICTORS
OF INFORMATION SEEKING
AND MEDIA USE

A Multivariate Re-analysis

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September, 1967

ACKNOWLEDGMENTS

Those who work with existing data, as from social data archives, are often only vaguely aware of their debt to the research team that collected the data. In the present case, we know exactly our debt to the dozen and more people who labored to collect and organize these data, because we shared that task. Their names are listed in Patterns of Adult Information Seeking (Parker and Paisley, 1966), the project's technical report to the U.S. Office of Education.

We have a particular debt to Edwin B. Parker, principal investigator on the original project, for guiding the collection of data rich enough to compel secondary analysis of this kind.

This long and in some ways complicated report was produced -- we think handsomely -- by Mrs. Violet Lofgren of the Institute for Communication Research.

CONTENTS

Introduction . . . . I - 1

Purpose of this report . . . . I - 1

Source of data . . . . I - 3

Range of variables included . . . . I - 4

The analysis model . . . . I - 5

The Predictor Set . . . . II - 1

Social predictors . . . . II - 1

Psychological predictors . . . . II - 2

Interrelationships among predictors . . . . . . II - 6

Information Seeking and Media Use Behaviors . . . . . . III - 1

Readership of newspapers . . . . III - 6

Readership of all magazines . . . . III - 9

Readership of Readers' Digest . . . . III - 12

Readership of Life . . . . III - 15

Readership of newsmagazines . . . . III - 18

Readership of home/garden magazines . . . . . . III - 21

Readership of women's fashion magazines . . . . . III - 24

Readership of women's home/family magazines . . . . III - 27

Readership of all books . . . . III - 30

Readership of fiction . . . . III - 33

Readership of nonfiction . . . . III - 36

(continued)

CONTENTS (continued)

Use of the public library . . . . III - 39

Use of reference books . . . . III - 42

Informational use of radio . . . . III - 45

Music/entertainment use of radio . . . . III - 48

Use of "serious" television programs . . . . . III - 51

Specific information seeking in the media . . . III - 54

General use of impersonal information sources . . III - 57

General use of interpersonal information sources . III - 60

Total participation in adult education . . . . III - 63

Participation in vocational adult education . . . III - 66

Participation in arts/crafts adult education . . III - 69

Participation in liberal arts adult education . . III - 72

Attendance at evening classes and lectures . . . III - 75

Self-study adult education . . . . III - 78

Discussion . . . . IV - 1

Behaviors with similar predictor-profiles . . . IV - 1

Utility of these findings . . . . IV - 5

Observations about this analysis model . . . . IV - 7

Other analysis models for such data . . . . . IV - 12

Convergent validation through replication . . . IV - 18

References . . . .

LIST OF TABLES AND FIGURES

Table 1. Zero-order correlations among 10 predictors . . II - 7

Table 2. Zero-order correlations of the 10 predictors with the 25 information-use behaviors . . . . III - 2

Figure 1. Significant partialled predictors of number of newspapers read regularly . . . . III - 7

Table 3. Newspaper readership by education and income . . III - 8

Figure 2. Significant partialled predictors of number of magazines read regularly . . . . III - 10

Table 4. Magazine readership by education and sex . . . III - 11

Figure 3. Significant partialled predictors of _Readers'_ _Digest_ readership . . . . III - 13

Table 5. _Readers'_ _Digest_ readership by age . . . . . . III - 14

Figure 4. Significant partialled predictors of _Life_ readership . . . . III - 16

Table 6. _Life_ readership by occupation and perception of practical education in the media . III - 17

Figure 5. Significant partialled predictors of newsmagazine readership . . . . III - 19

Table 7. Newsmagazine readership by education . . . . III - 20

Figure 6. Significant partialled predictors of readership of home/garden magazines . . . . . . III - 22

Table 8. Readership of home/garden magazines by sex . . III - 23

Figure 7. Significant partialled predictors of women's magazines, primarily fashion . . . . III - 25

Table 9. Readership of fashion magazines by sex . . . . III - 26

Figure 8. Significant partialled predictors of women's magazines, primarily home and family . . III - 28

Table 10. Readership of home/family magazines by sex . . III - 29

Figure 9. Significant partialled predictors of number of books read . . . . III - 31

(continued)

LIST OF TABLES AND FIGURES (continued)

Table 11. Book readership by education . . . . III - 32

Figure 10. Significant partialled predictors of fiction reading . . . . III - 34

Table 12. Fiction reading by sex and education . . . . III - 35

Figure 11. Significant partialled predictors of nonfiction reading . . . . III - 37

Table 13. Nonfiction reading by achievement motivation . . III - 38

Figure 12. Significant partialled predictors of last visit to public library . . . . III - 40

Table 14. Last visit to public library by education and age . . . . III - 41

Figure 13. Significant partialled predictors of use of reference books . . . . III - 43

Table 15. Use of reference books by age, sex, and perception of positive consequences from new media . . . . III - 44

Figure 14. Significant partialled predictors of use of radio for information . . . . III - 46

Table 16. Informational use of radio by age . . . . . III - 47

Figure 15. Significant partialled predictors of use of radio for music and entertainment . . . III - 49

Table 17. Music/entertainment use of radio by age . . . III - 50

Figure 16. Significant partialled predictors of serious television program viewing . . . . . III - 52

Table 18. Viewing of serious television programs by achievement motivation and perception of practical education in the media . . . . . . III - 53

Figure 17. Significant partialled predictors of specific information seeking in the media . . . III - 55

Table 19. Specific information seeking in the media by perception of practical education in the media and perception of positive consequences from new media . . . . III - 56

(continued)

LIST OF TABLES AND FIGURES (continued)

Figure 18. Significant partialled predictors of impersonal information seeking . . . . . . III - 58

Table 20. Impersonal information seeking by perception of positive consequences from new media and perception of practical education in the media . III - 59

Figure 19. Significant partialled predictors of interpersonal information seeking . . . . . III - 61

Table 21. Interpersonal information seeking by income and number of organizational memberships . . . III - 62

Figure 20. Significant partialled predictors of total adult education participation . . . . . III - 64

Table 22. Total adult education participation by age, perception of positive consequences from new media, and perception of practical education in the media . . . . . . III - 65

Figure 21. Significant partialled predictors of participation in vocational adult education . . III - 67

Table 23. Participation in vocational adult education by age and occupation . . . . . . III - 68

Figure 22. Significant partialled predictors of participation in arts/crafts adult education . . III - 70

Table 24. Participation in arts/crafts adult education by sex and age . . . . . . III - 71

Figure 23. Significant partialled predictors of participation in liberal arts adult education . III - 73

Table 25. Participation in liberal arts adult education by sex and perception of positive consequences from new media . . . . . . III - 74

Figure 24. Significant partialled predictors of attendance at evening classes and lectures . . III - 76

Table 26. Attendance at evening classes and lectures by sex and education . . . . . . III - 77

Figure 25. Significant partialled predictors of reported self-study . . . . . . III - 79

Table 27. Reported self-study by perception of positive consequences from new media . . . . III - 80

INTRODUCTION

Purpose of This Report

Information seeking and mass media use are the foundations of adult public knowledge. The adult American lives, works and votes in a world that changes profoundly from decade to decade. Will Rogers' remark notwithstanding, people do know more than what they read in newspapers, but their knowledge of contemporary events depends on some combination of information sources: mass media, adult education, friends, and so on.

In recent years these "information-processing behaviors" have begun to receive the study they deserve. A few titles will illustrate the range and excellence of such studies: The Library's Public (Berelson, 1949), The Public Impact of Science in the Mass Media (U. Michigan, Survey Research Center, 1958), The People Look at Television (Steiner, 1963), The People Look at Educational Television (Schramm, Lyle, and Pool, 1963), Adult Book Reading in the United States (Ennis, 1965), and Volunteers for Learning (Johnstone and Rivera, 1965). In Patterns of Adult Information Seeking (1966), Parker and Paisley encompassed many information-processing behaviors in two community studies, sacrificing the depth of a single-medium approach to reveal diverse "information diets" chosen from the too-rich "information menu" (borrowing Steiner's apt metaphor, 1963).

Taken together, these studies present a coherent and face-valid picture of the adult American as media user and information seeker. They tell us that population subgroups differ strikingly in mass media use and in information-seeking strategies (e.g., in the Parker-Paisley data for the community of Fresno, 60 per cent of the college graduates, versus 21 per cent of those with less than a high school diploma, had read a book in the month prior to the survey). Taking a single social or personal attribute at a time (e.g., occupation), their findings allow us to "map" many information-processing behaviors on the basis of that attribute in the population of adult Americans.

These studies can be taken a step further, in the direction of multivariate analysis. For instance, in addition to tabulating book-reading behavior within educational subgroups, we can learn the *comparative* strength of education, sex, age, and other attributes as predictors of that behavior. The possibility that a predictor might be *spuriously* strong, thanks to its own correlation with another strong predictor, requires us to compare predictors in a multivariate analysis in which all are *simultaneously* taken account of.

A valid multivariate analysis is easier to discuss than to achieve. No analysis model is self-evidently appropriate. Nevertheless, proceeding tentatively and in the spirit of *convergent validation* (see Campbell and Fiske, 1959; Webb *et alia*, 1966), we may adopt a simple multivariate model to examine further the complex pattern of media use and information seeking in the population.

When psychological variables (e.g., achievement motivation) are included in the predictor set, multivariate analysis is an imperative. In accounting for information-processing behaviors, we should exhaust the predictive power of "simpler" life-cycle and life-style attributes (e.g., sex, age, education, occupation, income) before introducing psychological traits and drives that are less reliably measured. Another way of saying this: if age and achievement motivation are equally strong predictors of a behavior such as adult education participation, other variables held constant, then in our interpretation we would favor the firm data of age over the soft data of achievement motivation.

This is not to say that psychological variables can be dismissed from a multivariate analysis. In a sample of San Mateo men, Rees (1967, and in Parker and Paisley, 1966) found that achievement motivation was a significant predictor of many information-processing behaviors, even with age, education, and occupation held constant. On the contrary, the case for achievement motivation depended upon, and was confirmed by, a multivariate analysis.

In this report we intend to show patterns of multivariate prediction for 25 media use and information-seeking behaviors, following the simplest parametric multivariate model. In some respects, this report is a sequel to Rees' study of achievement motivation and information-processing behaviors in San Mateo, with differences that will be detailed below. It introduces two other psychological variables and seven social-personal variables for simultaneous control. We hope ourselves to replicate, and certainly encourage others to replicate, such an analysis with other information-processing data, in search of the convergent validation that is the criterion of an acceptable multivariate interpretation.

Source of Data

These data were collected in Fresno, California, in June and July of 1965, in the second of two community studies of adult information seeking conducted by the Stanford Institute for Communication Research (under contract to the U. S. Office of Education, Edwin B. Parker, principal investigator). The prior study was conducted in San Mateo, California, in January of 1965.

A descriptive, essentially bivariate analysis of both studies was reported in Patterns of Adult Information Seeking (to which the present authors contributed chapters). Because of the range of behaviors described, in Patterns of Adult Information Seeking we were rarely able to go beyond single-predictor analysis. Occasionally we used a three-predictor model and once, in Rees' chapter, a five-predictor model. The new analyses reported below are therefore an extension, in the same spirit but with much reduction in detail, of the original analyses.

The Fresno survey was based on a probability sampling plan down to the individual respondent. Personal interviews of about an hour in length were obtained from 1294 respondents. The detailed sampling plan, question texts, and marginal percentages can be found in Patterns of Adult Information Seeking.*

This re-analysis of Fresno data is in several instances a first analysis. Readership of individual magazines and groups of magazines is reported at length because we were unable to include such data at all in the original, very long report. Television viewing is completely coded for the first time. A new scale of achievement motivation has been created.** A new work deck, prepared for multiple regression analysis, includes many scales and indices not reported in Patterns of Adult Information Seeking.

Range of Variables Included

Our predictors include seven social-personal variables (age, sex, education, occupation, income, marital status, number of organizational memberships) and three psychological variables (achievement motivation, perception of "practical education" in the media, perception of positive consequences from new media. These predictors were chosen on the basis of a priori relevance to media use and information seeking. A variable such as marital status was retained in the set, although it is predictively weak, because it clearly belongs in any characterization of life style.

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* Of which a few copies are still available from the Institute for Communication Research, Stanford University, Stanford, California 94305 (free).

** This difficult coding was performed by Charlyn Awenius, with some help from the second author.

Sixteen media uses are included in the set of dependent variables. They deal with the use of newspapers, magazines, radio, television, and books. The coverage of media is not equitable (perhaps another data set can fill in the gaps); for instance, there are seven magazine uses and only one newspaper use. Nine variables deal with information seeking in the abstract or with adult education, which is construed as a form of information seeking. One information-seeking variable focuses on the media and could be considered a media variable also (specific information seeking in the media).

The Analysis Model

Lacking contrary evidence, the best multivariate analysis model to adopt is the simplest one. It is better to elaborate a simple model on the basis of its own performance than to begin with a complex model. We felt that the model to adopt was a multiple linear equation, in which the ten predictors combine additively to estimate the level of the dependent variable for each observation. Our approach combines multiple/partial correlation and multiple/partial regression, but we are chiefly interested in the magnitude and significance of each predictor's partial regression coefficient -- that is, in the predictor's power to account for the dependent variable when other predictors are simultaneously considered.

This model has shortcomings, minor or major depending on the nature of the data (see Paisley, 1965; Paisley and Ruggels, 1965). It utilizes only the linear component of a predictor's total association with a dependent variable; potentially significant nonlinear components are lost. Furthermore, the assumption that predictors ought to combine additively, without multiplicative interactions, may not be tenable. Finally, distributional skewness in any predictor or in the dependent variable can lead to an underestimate of predictive strength.

Therefore the linear model is adopted only as a first approximation to a good fit of the data. Its performance was encouraging in a recent study by Paisley and Parker (1967), in which a multiple linear model (incorporating information-processing and other variables) accounted for 50 per cent of the variance in productivity reported by a sample of researchers. Further discussion of the analysis model, and consideration of two excellent alternatives, will be found in the Discussion section of this report.

THE PREDICTOR SET

Social Predictors

Seven of the ten predictors may be classified as social, and these form two groups: life-cycle and life-style. Life cycle is represented by age and sex. Six decades of age levels are used for the analysis, with 40 per cent of the respondents between the ages of 18 and 39. The male-female ratio was approximately 1:2.

While age and sex describe the respondent's life cycle, education, occupation, income, marital status, and number of organizational memberships are achievement variables representative of life style.

Education is coded in five levels. Twenty-one per cent of the sample had not been to high school, 20 per cent had some high school, 23 per cent graduated from high school, 24 per cent had some college, and 12 per cent graduated from college.

Occupation, a categorical rather than continuous variable for most analysis purposes, is coded in three levels to reflect what we think is a latent dimension of status and life style differences. Levels on the ordinal scale are professional/managerial (28 per cent of the sample), white-collar (14 per cent), and blue-collar/other/non-working (52 per cent, of whom only a trace are non-working). In the case of non-working housewives, the husband's occupation was used.

Income is a seven level variable describing the total family income before taxes. Forty per cent indicated that their families earned less than $5,000, 42 per cent between $5000 and $9999, and 18 per cent over $10,000.

Marital status is coded in two levels to reflect the basic life-style difference of whether or not the person was presented as married and living with spouse. Sixty-eight per cent of the sample was married, by this definition.

Forty-five per cent of the Fresno respondents reported no organizational memberships, 29 per cent reported one, 13 per cent two, and 14 per cent three or more. This variable was included to round out our picture of individual life style.

Psychological Predictors

1. Perception of "practical education" in the mass media. Respondents were asked, "Sometimes the communication media we've been talking about offer readily available and practical education. From your own experience, would you say this is true of newspapers?" All four media were covered in each interview schedule. If the respondent said yes to any part of the question, the interviewer probed for the kinds of "practical education" that were being thought of. In the original analysis, these responses were coded into such categories as "tools for daily living", "moral or religious instruction", "information useful for leisure time activities", and so on.

For the regression analysis, a scale was constructed from the number of media for which a respondent mentioned "practical education". The percentage of respondents at each scale level was: none, 8 per cent; one, 15 per cent; two, 29 per cent; three, 30 per cent; four, 17 per cent.

It is expected that perception of "practical education" in the mass media creates a "path", in the Lewinian sense (1936), that will lead one to the mass media when he is seeking information.

2. Perception of positive consequences in the development of new media and educational technology. A set of five questions dealt with perceived consequences of new media and educational technology. The first, general, question was: "There has been a lot of talk about new inventions that will greatly change our communication systems and our educational systems. Can you think of any recent inventions or developments that are likely to have this effect? What changes do you expect to see?" Then followed four specific questions: "What about UHF television? What changes do you expect to see when more UHF stations are on the air across the country?" "What about communication satellites? Do you expect to benefit from communication satellites? How?" "What about computers? Do you foresee any changes in communication or education now that computers are coming into general use?" "What about teaching machines? What advantages might teaching machines possess?"

In the original analysis, responses were coded first as optimistic (positive consequences) or pessimistic (negative consequences) and secondly as quality-oriented (improved content in communication and education) or quantity-oriented (faster communication/education, more of it). Many respondents, an average of 60 per cent across the five questions, had neither positive nor negative consequences to suggest.

For correlational analysis, a scale was constructed from the number of developments to which a respondent attributed positive consequences (if he mentioned UHF, satellites, computers, or teaching machines in response to the general question, he was given credit for the specific follow-up question also, without actually being asked about the development a second time). The percentage of respondents at each scale level was: none, 18 per cent; one, 18 per cent; two, 21 per cent; three, 18 per cent; four, 17 per cent; five, 8 per cent.

We interpret this perception of positive consequences as a sign of some flexibility and openness to change. It seems probable that a person favorably disposed to new media and new educational technology would use existing media and information sources with some versatility.

3. Achievement motivation. The relation of achievement motivation to media use and information seeking was studied in San Mateo by Rees (Rees, 1966a, 1966b, 1967; and Parker and Paisley, 1966). Findings of that study will be discussed in appropriate sections of Part III, below.

For the present analysis of Fresno data, achievement motivation was scored on the basis of responses to these five questions: "In what ways do you think your life today is different from what it was five years ago?" "What changes do you expect in the next five years of your life?" "Can you think of anything you're doing right now that will affect your life five years from now?" "Each person regards certain occupations more favorably than others. From your point of view, what makes an occupation a good occupation?" (From the section on previous schooling:) "What are some of the things you liked about school?" Following the lead of McClelland (1953), Veroff et alia (1960), and others, achievement imagery in the five responses led to an achievement motivation score from 1 (no achievement imagery detected) to 4 (rich in achievement imagery). The percentage of respondents at each scale level was: one (including a few uncodable cases), 50 per cent; two, 27 per cent; three and four, 24 per cent.

Because the self-report questions elicited very different responses according to the respondent's sex, age, and education, the sample was stratified on these attributes (and, in the case of women, on the attribute of working or not working outside the home) before coding. That is, 27 demographic subgroups were created on the basis of sex, age (21-30, 31-55, 56 and over), education (less than high school graduation, high school graduation, at least some college), and women's working or not working outside the home. The handful of respondents below 21 years responded erratically to the five questions, most of which were intended for adults with stable life-styles. These respondents were therefore dropped from the coding and assigned the modal score, 1.

Achievement motivation scoring was performed on one demographic subgroup at a time -- for instance, college-educated men over 55 years of age were scored as a group. Each respondent's score was assigned _relative to the scores of others in his subgroup_. This means that the same response pattern might lead to different achievement motivation scores, high in a subgroup that is otherwise low-scoring and low in a subgroup that is otherwise high-scoring. Such relative scoring was intended to avoid a confounding of life cycle and achievement motivation (see Veroff _et alia_, 1960).

Reliability of achievement motivation scoring, as tested by two coders working independently, was in the marginal-to-satisfactory range that is typical of such efforts.

Relationships among Predictors

The zero-order or two-variable correlations among the ten predictors are presented in Table 1. The education, income, and occupation triad gives evidence of face validity: they are all highly correlated, as is to be expected. The negative correlations of age with education and age with income are consistent with known U.S. demographic relationships, while the negative correlation between age and marital status shows that there are more "single" older respondents (e.g., through failure to marry, death, and divorce) than "single" younger respondents.

The fairly low correlation between education and achievement motivation, and the negligible correlation of age and sex with achievement motivation, is explained by the scoring procedure. Since each respondent was scored relative to the average score of a subgroup with equivalent education, sex, and age, we expected achievement motivation and the three variables to be only moderately correlated.

The psychological predictor we have called "perception of positive consequences in the development of new media and technology", perhaps an indicator of flexibility and openness to change, behaves in many ways like an alternative measure of education. That is, it follows the pattern of education's correlation with other predictors. There are two probable reasons for the .44 correlation between education and this psychological predictor: (1) before the respondent can mention positive consequences of a development, he must first be able to mention some consequences of any kind; education contributes a knowledge of consequences; (2) education does develop flexibility and a willingness

Table 1. Zero-order correlations among 10 predictors (decimal points and correlations below .10 omitted for clarity).

	Sex	Education	Income	Occupation	Marital status	Organizational memberships	Practical education in the media	Positive consequences of change	Achievement motivation
Age	-	-30	-25	-	-22	11	-	-22	-
Sex		-	-11	-	-16	-	-	-21	-
Education			47	51	13	32	13	44	20
Income				44	43	26	-	35	12
Occupation					18	26	11	32	12
Marital status						10	-	22	-
Organizational memberships							12	23	16
Practical education in the media								29	11
Positive consequences of change									23

to accept new inventions and practices. In using this predictor, we should remember the extent to which it is affected by education.

Part III of this report now discusses the predictability, on the basis of these 10 predictors, of each of the 25 information seeking and media use variables.

INFORMATION SEEKING AND MEDIA USE BEHAVIORS

In this section, patterns of prediction are presented three ways: (1) individual correlations between predictors and the seeking/use behaviors, (2) a "partialled predictor profile" for each behavior, showing the unique strength of each predictor, others "held constant", (3) a percentage-trend table for each behavior, showing how much subgroup-to-subgroup variation the strongest predictor(s) account for.

Table 2 summarizes the individual (unpartialled) relationships between predictors and seeking/use behaviors. Given the nature of survey data, these Pearson correlations should be interpreted judiciously. That is, some predictors and behaviors are dichotomous (sex, marital status, readership of newsmagazines, etc.); others have only a few levels (occupation, achievement motivation, number of newspapers read, etc.). Even variables with a good range and a pure counting metric (such as number of adult education activities in the past five years) tend to be positively skewed.

Still, Table 2 shows patterns that we would foresee in data of any quality. Education's strongest correlates are behaviors that education prepares people for: magazine and book use, public library visits, and adult education participation. Achievement motivation's strongest correlates are library use, adult education, and specific information seeking in the media. And so on. Anomalous patterns do not appear.

There are two ways to read Table 2. The highest value in a column shows the behavior that a predictor best predicts. For example,

Table 2. Zero-order correlations of the 10 predictors with the 25 information-use behaviors (decimal points and correlations below .10 omitted for clarity).

	Age	Sex	Education	Income	Occupation	Marital Status	Organizational memberships	Practical educ. in media	Positive consequences of change	Achievement motivation
Number of newspapers read	-	-	26	26	18	12	22	16	22	13
Number of magazines read	-	-	38	29	28	13	26	21	30	14
- Reader's Digest	13	-	12	12	14	-	12	-	14	-
- Life	-10	-	15	14	14	-	-	-	11	-
- 3 newsmagazines	-	-10	29	21	21	-	17	-	19	14
- home/garden magazines	-	15	-	11	-	11	-	10	10	-
- fashion magazines	-	26	-	-	-	-	-	-	-	-
- other women's magazines	-	30	-	-	-	-	-	-	-	-
Radio, informational use	22	-14	-	-	-	-	19	13	-	-
Radio, music/entertainment use	-31	-	11	-	-	-	-	-	14	-
Television, "serious" content	-	-	14	10	14	-	14	18	18	14
Number of books read	-12	-	30	17	22	-	17	-	22	17
- non-fiction reading	-	-	16	-	15	-	15	11	16	15
- fiction reading	-12	10	26	18	20	-	13	-	17	10
- reference book use	-19	-	25	21	18	14	15	16	28	15
Last visit to public library	-27	-	45	28	27	10	20	15	34	18
Adult education, total partic.	-32	-14	36	28	26	12	20	21	37	19
- vocational participation	-21	-12	30	25	28	-	14	14	28	13
- arts/crafts participation	-17	-27	-	-	-	-	-	-	-	-
- liberal arts participation	-14	14	20	14	12	-	15	18	24	15
- evening classes & lectures	-25	-	39	26	29	-	22	19	31	17
- self-study	-12	-12	25	16	18	-	14	11	23	14
Specific media information use	-	-	22	24	18	16	23	29	36	19
Interpersonal information seeking	-	-	22	24	19	-	26	16	25	15
Impersonal information seeking	-	-	31	25	23	15	22	27	39	13

age is most strongly associated with total participation in adult education (older people participating less). The highest value in a row shows the strongest unpartialled predictor of a behavior. For example, education is the strongest unpartialled predictor of total magazine and book reading.

Interpreting Figures 1-25. This section consists primarily of 25 sets of figures and tables, with accompanying discussions. Each figure summarizes the results of a multiple correlation analysis. For reasons that will be explained in Part IV, we are not interested in R, the 10-predictor multiple correlation coefficient, for its own sake; therefore it is not reported. Each figure presents only the relative predictive strengths of all statistically significant predictors.

The left margin of each figure shows values of the *t* statistic that we use to evaluate the significance of each partialled predictor. Higher values of *t*, either positive or negative, represent greater predictive strength. Therefore the predictors themselves, listed in the center of each figure, form a ladder or thermometer scale of strength. Predictors with *t* values below 2.0 would not be considered statistically significant; they are omitted. On the right margin appear probability estimates associated with each range of *t* values. All *t* values of 3.3 and greater, for instance, show relationship of a strength that would occur by chance (in a large number of equal samples similarly drawn from the same population) less than once in 1000 trials.

We can read Figure 1 as showing two highly significant predictors, income and education, followed by six other predictors that at least reach statistical significance. The fact that the rank order of these eight predictors does not follow the rank order of Table 2 tells us that partialling has removed the "boost" that some predictors receive in Table 2 through their correlation with other predictors. As an example, perception of positive consequences (etc.) is among the four strongest predictors of newspaper reading in Table 2, thanks in part to its strong correlation with education (in first-order partialling, removing only the effect of education, the relationship between perception of positive consequences and newspaper reading falls from .22 to .12). In Figure 1 this predictor drops to sixth place, while age, freed from the "suppressing effect" of education (i.e., that older people seem to read newspapers less only because fewer of them have high education, and that older people _within_ an educational subgroup actually read newspapers more than younger people) climbs to fifth place in strength.*

Interpreting Tables 3-27. Percentage tables answer the question, "How much difference does it make?" In Table 3, for instance, we see that, within the lowest educational subgroup, newspaper reading doubles from low to high income levels. Also, reading the leftmost percentages vertically, we see that education accounts for a 20 per cent difference in the lowest income subgroup. Although other trends in the table are not perfect, we receive the impression that income makes more of a difference than education and that percentage shifts from low to high subgroups are in the 10 to 30 per cent range. It also seems that education and income are "interacting": education makes no clear difference in the highest income group and reaches a plateau beyond high school graduation in the middle income group.

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* The sign of the _t_ value indicates the direction of the relationship. In two cases the sign is arbitrary: + for sex indicates that women are higher in the behavior than men; + for marital status indicates that married people are higher in the behavior than single, separated, divorced, and widowed. Otherwise + indicates that more of the attribute (e.g., income) is associated with more of the behavior (e.g., newspaper reading).

In each of the 25 cases, we display percentages within all subgroups of the strongest predictor or predictors. Income and education are the strongest predictors in Figure 1; therefore they appear in the corresponding Table 3. If a single predictor dominates an analysis (e.g., age in Figure 3), then only that predictor appears in the corresponding percentage table. In some cases as many as three predictors are retained in the percentage table to show patterns of interaction.

The question, "How much of a percentage difference is required for practical significance?", has no single answer. Certainly the 18 to 89 per cent range in Table 22 has great practical significance for adult educators. Whether the 27 to 64 per cent range of library use in Table 14 has practical significance depends ultimately on the library's goals in attracting and serving the high and low subgroups.

Readership of Newspapers

All but 7 per cent of the sample reported reading at least one newspaper regularly. Forty-six per cent read two or more newspapers. Table 2 shows that three social predictors and one psychological predictor (education, income, organizational memberships, and perception of positive consequences from new media) are the strongest individual correlates of this behavior. When all predictors are considered simultaneously in the multiple regression analysis (see Figure 1), income emerges as the strongest predictor, followed -- in the highly significant range -- by education and perception of practical education in the media.

The percentage trends of newspaper reading in Table 3 have already been discussed as examples on page III-5.

Our profile of newspaper reading resembles that of Schramm and White (1949) and our own San Mateo data. Education, economic status, and age are strong predictors in all three studies. However, the San Mateo data also show an occupational relationship, even with education controlled.

Discrepancies in the set of strongest predictors, as between San Mateo and Fresno, may be attributed to many characteristics of study design and execution. We rely on the principle of convergent validation to draw our attention to consistencies rather than discrepancies.

Figure 1. Significant partialled predictors of number of newspapers read regularly.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2	Income (4.2)	
4.0		
3.8	Education (3.8)	
3.6		
3.4		
	Perception of practical education in the media (3.3)	.001
3.2	Number of organizational memberships (3.2)	
3.0	Age (3.0)	
2.8		
2.6		.01
	Perception of positive consequences from new media (2.5)	
2.4		
		.02
2.2		
	Achievement motivation (2.0)	
2.0	Sex (2.0)	.05

Table 3. Daily newspaper reading: per cent reading two or more daily newspapers, by education and income.

Less than high school graduate			
Less than $5,000 per year	32%		
$5,000 - $10,000		38%	
Over $10,000			66%
High school graduate			
Less than $5,000	33%		
$5,000 - $10,000		44%	
Over $10,000			39%
Some college			
Less than $5,000	43%		
$5,000 - $10,000		59%	
Over $10,000			66%
College graduate			
Less than $5,000	53%		
$5,000 - $10,000		58%	
Over $10,000			62%

(These percentages are based on subgroups, in descending order, of 323, 160, 35, 99, 157, 56, 80, 146, 83, 17, 81, 57.)

Readership of Magazines in General

Beyond the strong and regular percentage trends of Table 4, there are several aspects of magazine readership that make it an interesting case for multivariate analysis. Although number of magazines read does not form a normal distribution (in fact, it is rectangular, with 24 per cent of the sample reading no magazines and 28 per cent reading four or more), it has strong zero-order correlates in education, perception of positive consequences, income, occupation, and organizational memberships. The place of education as strongest predictor is confirmed in the multivariate analysis, by a wide margin.

It will be noticed that sex climbs to second place in Figure 2 from "nowhere" in Table 2. It happens that, within educational levels, women read more magazines than men, but other predictors positively correlated with magazine reading and negatively correlated with sex "suppress" the correlation between sex and magazine reading. For instance, the correlation between sex and magazine reading more than doubles when the effects of income and perception of positive consequences are controlled. The "suppressor problem" is discussed again on page III-12.

At the same time, perception of positive consequences drops from second place to fourth in predictive strength. Controls on education, income, and occupation have this effect.

Two independent studies show somewhat similar results. MacLean (1952) relates magazine readership to education, income, and social activity (all significant in Figure 2). San Mateo data show the primacy of education but no sex difference, because no partialling was done.

Figure 2. Significant partialled predictors of numbers of magazines read regularly.

+ or - *t* value of predictor's partial regression coefficient	Predictors in rank order	*p* value
Values above 6.0	Education (7.1)	
6.0		
5.8		
5.6		
5.4		
5.2	Sex (5.2)	
5.0		
4.8		
4.6		
4.4	Perception of practical education in the media (4.4)	
4.2		
4.0		
	Perception of positive consequences from new media (3.9)	
3.8		
3.6		
3.4	Number of organizational memberships (3.4)	
		.001
3.2		
3.0		
2.8	Income (2.8)	
2.6	Age (2.6)	.01
2.4		
		.02
2.2		
2.0		.05

Table 4. Total magazine reading: per cent reading two or more magazines, of all kinds, by education and sex.

Men				
Less than high school graduate	42%			
High school graduate		63%		
Some college			70%	
College graduate				80%
Women				
Less than high school graduate	50%			
High school graduate		65%		
Some college			77%	
College graduate				90%

(These percentages are based on subgroups, in descending order, of 169, 99, 124, 77, 349, 213, 185, 78.)

Readership of Readers' Digest

After examining the predictors of overall magazine readership, we separated out for further analysis two individual magazines and four groups of magazines that represent interesting differences in content (some magazines were aggregated into groups because of insufficient separate readership).

According to our data, the Readers' Digest is twice as popular with respondents above 40 as with respondents below that age. Yet the individual correlation between age and Readers' Digest readership is not strong (see Table 2). Part of the discrepancy lies in the use of a linear correlation statistic for a curvilinear trend: Readers' Digest readership falls off slightly among the oldest respondents. Control on education, a strong negative correlate of age, "straightens out" the age-reading relationship. At the same educational level, older respondents are much more likely to read Readers' Digest than are younger respondents, but there are not enough well-educated older respondents to bring up the absolute percentage of readership for that age group. By cancelling out much of the educational disadvantage of the older group, the multivariate analysis shows us the strength of the age-reading relationship.

Unfortunately, when we look for evidence in other studies of an enhanced age-reading relationship through educational control, we find that the multivariate approach has been especially rare in the case of individual magazines. Replication is needed in this case.

Figure 3. Significant partialled predictors of *Readers Digest* readership.

Values above 6.0	Age (6.9)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4	Perception of positive consequences from new media (3.4)	
		.001
3.2	Sex (3.2	
3.0		
2.8		
2.6		.01
2.4		
	Marital status (2.3)	.02
2.2		
	Education (2.1)	
2.0		.05
+ or − *t* value of predictor's partial regression coefficient	Predictors in rank order	*p* value

Table 5. Per cent reading Readers' Digest by age.

Age group 18-39	15%
Age group 40-59	33%
Age group 60 and over	29%

(These percentages are based on subgroups, in descending order, of 522, 475, 297.)

Readership of Life

Only 19 per cent of the sample reported reading Life.* Therefore we have a dichotomous behavior with 19 per cent "yes" and 81 per cent "no": a relatively rare event for statistical prediction. Table 2 and Figure 4 both show weak prediction as a consequence.

Education, occupation, and income are the strongest individual correlates. When all variables are controlled in the multiple regression analysis, occupation remains marginally significant. Perception of practical education in the media rises to first place from an insignificant level in Table 2.

Table 6 shows that the contributions of occupation and perception of practical education are additive rather than multiplicative; the percentage trends are nearly parallel.

This is the first analysis in our set of 25 that shows a psychological predictor to be strongest. Altogether, 7 of the 25 behaviors are most strongly predicted by perception of practical education, perception of positive consequences, or achievement motivation. That is, in more than one-fourth of our analyses, we would find a different predictive pattern if these psychological predictors were not included. The prospect of an overlooked predictor always disturbs us in multivariate analysis. Data availability often limits the predictor set. In this study we feel that our extra labor in preparing psychological predictors is justified.

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* Proprietary reader-research data (not fully cited here) shows a national Life readership of about 27 per cent. Similarly, our data show a 26 per cent Readers' Digest readership, while the commercial data show 32-33 per cent. Difference in question wording (e.g., "regularly" vs. "almost every issue") is a possible explanation.

Figure 4. Significant partialled predictors of Life readership.

Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
3.0		
2.8		
2.6		.01
2.4		
	Perception of practical education in the media (2.3)	.02
2.2		
2.0	Occupation (2.0)	.05
+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value

Table 6. Per cent reading *Life* by occupation and perception of practical education in the media.

Blue collar, other		
Low perception of practical education	12%	
High perception of practical education		18%
White collar, managerial, professional		
Low perception of practical education	23%	
High perception of practical education		27%

(These percentages are based on subgroups, in descending order, of 417, 333, 271, 273.)

Readership of Newsmagazines

Education is our best "locator" of those in the sample who reported reading *Time*, *Newsweek*, or *U.S. News and World Report*. Table 2 shows that income and occupation tie as second strongest individual predictors. Under partialling, both education and income remain strong, but occupation falls to an insignificant level and third place in the predictor pattern is assumed by achievement motivation.

Table 7 shows the strength of the correlation between education and newsmagazine reading. There is a 37 per cent increase in this behavior from the subgroup that did not complete high school to the subgroup of college graduates.

Considering the importance of newsmagazines as encyclopedic (if far from perfect) information sources, the readership ratios at each end of the educational scale are important in themselves: 1:14 readers among those who did not complete high school, nearly 1:2 among the college graduates.

Figure 5. Significant partialled predictors of readership of Time, or Newsweek, or U.S. News and World Report.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8		
5.6		
	Education (5.5)	
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
3.0		
2.8		
	Income (2.7)	
2.6	Achievement motivation (2.6)	.01
2.4		
	Sex (-2.3)	.02
2.2		
2.0		.05

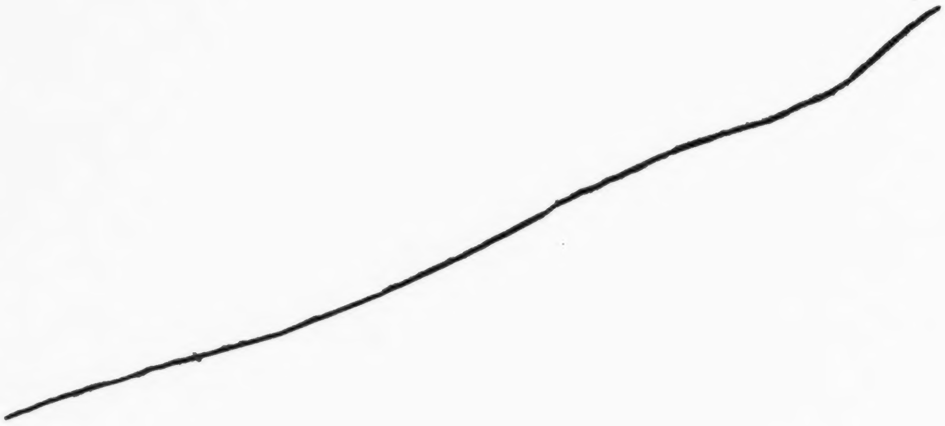

Table 7. Per cent reading newsmagazines by education.

Less than high school graduate	7%
High school graduate	12%
Some college	24%
College graduate	44%

(These percentages are based on subgroups, in descending order, of 518, 312, 309, 155.)

Readership of Home/Garden Magazines

We combined in this category all reported reading of such magazines as *American Home*, *Better Homes and Gardens*, *California Home*, *House Beautiful*, and *Sunset*. Two other categories of magazines -- "primarily fashion" and "primarily home and family" -- are somewhat related to this category.

Although sex is the strongest predictor of home/garden magazine readership, this category is actually the least sex-related of the three. The predictor profile for this category suggests to us the older married woman who is receptive to new media and technology and who sees practical education in the media, including magazines (see Figure 6).

Figure 6. Significant partialled predictors of readership of home/garden magazines.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Sex (6.9)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6	Marital status (3.6)	
3.4		.001
3.2		
3.0	Age (3.0)	
2.8	Perception of positive consequences from new media (2.8)	
2.6		.01
2.4	Perception of practical education in the media (2.4)	.02
2.2		
2.0		.05

Table 8. Per cent reading home/garden magazines by sex.

Men	7%
Women	17%

(These percentages are based on subgroups, in descending order, of 469 and 825.)

Readership of Women's Magazines, Primarily Fashion

To this category we assigned such magazines as Seventeen, Glamour, Vogue, and McCalls. Again sex is the strongest predictor both in individual correlations (Table 2) and in the multiple regression analysis (Figure 7).

Table 9 confirms the obvious: women are almost eight times as likely as men to read magazines in this set. The most likely reader of all is the woman with more-than-average education, according to the moderate predictive strength of education in Figure 7.

Figure 7. Significant partialled predictors of readership of women's magazines, primarily fashion.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Sex (10.2)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
3.0		
2.8		
2.6		.01
2.4		
	Education (2.3)	.02
2.2		
2.0		.05

Table 9. Per cent reading women's magazines, primarily fashion, by sex.

Men	3%
Women	23%

(These percentages are based on subgroups, in descending order, of 469 and 825.)

Readership of Women's Magazines, Primarily Home and Family

The final group of women's magazines included Good Housekeeping, Family Circle, Women's Day, Ladies' Home Journal, Redbook, Cosmopolitan*, etc. Both Table 2 and Figure 8 tell us that the analysis was scarcely worth doing. As Table 10 shows, women are nine times as likely as men to read a magazine in this group; there is no other significant predictor.

At this point the reader may wonder why we created three magazine categories with only minor differences in predictor profiles. The answer is that we expected more distinctive patterns -- for instance, home/garden magazines read both by men and by women, perhaps with an education factor; fashion magazines read by young, unmarried women; home/family magazines read by somewhat older, married women. If such patterns were in the data, even with sex as a single very strong predictor, we would have seen clues to them in these three analyses. It seems that we subdivided a media-use behavior that, in fact, has high internal consistency.

If the reader will forgive us for putting the best face on redundant analyses, Figures 6, 7, and 8 provide a reliability check. Three independent cuts at essentially the same behavior give us similar results.

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* These data were collected during the period of Cosmopolitan's editorial transition. It would be classified differently now.

Figure 8. Significant partialled predictors of readership of women's magazines, primarily home and family.

+ or − t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Sex (11.9)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
3.0		
2.8		
2.6		.01
2.4		
		.02
2.2		
2.0		.05

Table 10. Per cent reading women's magazines, primarily home and family, by sex.

Men	3%
Women	27%

(These percentages are based on subgroups, in descending order, of 469 and 825.)

Readership of All Books

Respondents were asked what books, if any, they had read during the past month. Sixty-four per cent had read none; 13 per cent had read one; 6 per cent two, and 15 per cent three or more. Table 2 shows that education is the best individual correlate, followed by occupation and perception of positive consequences of change.

In Figure 9, education remains the strongest predictor of book reading, but sex and achievement motivation have moved up from far down the list to tie for second place. Occupation and perception of positive consequences follow in third place.

The percentage trend in Table 11 is nearly linear, with a slightly accelerated step between high school completion and some college. The college graduate is almost three times as likely as the person who did not complete high school to have read one or more books during the month.

Figure 9. Significant partialled predictors of number of books read in past month.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
	Education (4.9)	
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
	Sex (3.3) Achievement motivation (3.3)	.001
3.2		
3.0		
2.8		
	Occupation (2.7) Perception of positive consequences from new media (2.7)	
2.6		.01
2.4	Number of organizational memberships (2.4)	
		.02
2.2		
	Marital status (-2.1)	
2.0		.05

Table 11. Per cent reading one or more books, of all kinds, in the past month, by education.

Less than high school graduate	21%
High school graduate	32%
Some college	49%
College graduate	59%

(These percentages are based on subgroups, in descending order, of 518, 312, 309, 155.)

Readership of Fiction

While total book reading formed a scale from zero to more than five books, we created binary yes-no measures of fiction and non-fiction reading. Each respondent could be represented as a fiction reader, a non-fiction reader, or both. Twenty per cent of the sample had read at least one fiction work.

Education and occupation are the strongest individual correlates of fiction reading in Table 2. Under partialling, sex outstrips both education and occupation: consistent with a recurrent finding (see, for instance, Berelson, 1949), women read more fiction than men. Table 12 shows that the sex difference persists at all education levels.

Marital status and age contribute to our understanding of this predictor profile. If an archetypal fiction reader were drawn from these data, she would be relatively well-educated, young, and unmarried.

The percentage range in Table 12, from 4 to 38 per cent, shows how specific a behavior even fiction reading is. Women with some college or more are eight times as likely as men with less than high school education to have read fiction during the month.

Figure 10. Significant partialled predictors of fiction reading.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0	Sex (5.0)	
4.8		
4.6		
4.4		
4.2		
4.0		
3.8	Education (3.8)	
3.6		
3.4		
		.001
3.2		
3.0		
	Marital Status (-2.9)	
2.8		
2.6	Occupation (2.6)	.01
2.4	Perception of positive consequences from new media (2.4)	
		.02
2.2		
	Income (2.1)	
2.0	Age (-2.0)	.05

Table 12. Per cent reading one or more fiction books in the past month, by sex and education.

Men	
Less than high school graduate	4%
High school graduate	11%
Some college	22%
College graduate	31%
Women	
Less than high school graduate	10%
High school graduate	25%
Some college	38%
College graduate	36%

(These percentages are based on subgroups, in descending order, of 169, 99, 124, 77, 349, 213, 185, 78.)

Readership of Non-fiction

Twenty-two per cent of the sample had read at least one non-fiction work during the month. Education and perception of positive consequences are the strongest individual correlates of this behavior in Table 2. Education disappears from the list of significant predictors under partialling, to be replaced by achievement motivation.

Table 13 shows that achievement motivation, although a "soft" psychological predictor handicapped by measurement error, discriminates among levels of non-fiction reading, just as Figure 11 shows that achievement motivation is a strong predictor even with the effects of life-cycle and life-style variables (especially age and education) removed. A respondent scoring high in achievement motivation is about twice as likely as a low-scoring respondent to have read non-fiction during the month. This is an extension of the Rees finding (1967) concerning achievement motivation and magazine content preferences.

Figure 11. Significant partialled predictors of non-fiction reading.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
	Achievement motivation (3.5)	
3.4		
		.001
3.2		
3.0		
2.8		
2.6	Number of organizational memberships (2.6)	.01
2.4		
	Occupation (2.2)	.02
2.2	Perception of positive consequences from new media (2.2)	
	Perception of practical education (2.1)	
2.0		.05

Table 13. Per cent reading one or more nonfiction books in the past month, by achievement motivation.

Low achievement motivation	16%
Medium achievement motivation	26%
High achievement motivation	31%

(These percentages are based on subgroups, in descending order, of 641, 346, 307.)

Use of the Public Library

Respondents were asked when they last used the public library. The answers were categorized into four time periods: within the past month, more than a month but less than a year, more than a year, and never.

According to Table 2, education and perception of positive consequences are the highest individual correlates of library use. (Library use happens to be the highest correlate of education among all 25 seeking/use behaviors, followed in order by attendance at evening classes and lectures and magazine readership.) The appearance of age high in the predictor profile of Figure 12 tells us that library users tend to be young.

Table 14, however, upsets the simple interpretation of Figure 12 and shows the value of the percentage tables in bringing non-linear trends and interactions to our attention. While it is true that library use declines with age within the three lower educational levels, among the college graduates the trend reverses and older college graduates report more recent visits to the library than do the younger.

We must also question the finding that, within the 18-39 age group, college graduates are not as regular in library use as, for instance, high school graduates with no college (43 to 64 per cent visiting library within past year). The finding is probably trustworthy, but we would not be justified in inferring less use of books from it. The young, well-educated person has a variety of book resources: his own collection, paperbacks, college libraries, etc.

Figure 12. Significant partialled predictors of recency of last visit to public library.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Education (8.4)	
6.0		
5.8		
	Age (-5.7)	
5.6		
5.4		
5.2		
5.0		
4.8		
4.6	Perception of positive consequences from new media (4.6)	
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
3.0		
2.8		
2.6		.01
	Number of organizational memberships (2.5)	
2.4		
	Achievement motivation (2.3)	.02
2.2		
2.0		.05

Table 14. Per cent visiting public library within past year, by education and age.

Less than high school graduate			
18-39	46%		
40-59		35%	
60 and over			27%
High school graduate			
18-39	64%		
40-59		50%	
60 and over			30%
Some college			
18-39	57%		
40-59		50%	
60 and over			33%
College graduate			
18-39	43%		
40-59		48%	
60 and over			58%

(These percentages are based on subgroups, in descending order, of 133, 201, 184, 160, 115, 37, 161, 105, 43, 68, 54, 33.)

Use of Reference Books

Respondents were asked, "During the past week, do you remember using any reference books?" Fifty-eight per cent of the sample had used one or more reference books.

The psychological predictor, perception of positive consequences from new media, is the highest individual correlate, followed by education. In the multiple regression analysis we find that perception of positive consequences maintains its predictive primacy. Age moves to second place (from fourth place) and sex to third place (from tenth place).

Table 15 presents the percentage of respondents using reference books by sex, age, and perception of positive consequences. We can see the unique effect of each of these predictors: more women than men use reference books; use of reference books declines with age, with the sharpest drop-off after 60; perception of positive consequences, that ubiquitous "openness" predictor, is associated with large percentage differences in use of reference books.

Figure 13. Significant partialled predictors of use of reference books.

Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
	Perception of positive consequences from new media (4.9)	
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6	Age (-3.6)	
3.4		
		.001
3.2		
3.0	Sex (3.0)	
2.8		
	Perception of practical education in the media (2.7)	
2.6		.01
	Achievement motivation (2.5)	
2.4		
		.02
2.2	Number of organizational memberships (2.2)	
	Education (2.1)	
2.0		.05
+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value

Table 15. Per cent using reference books in recent past, by sex, age, and perception of positive consequences from new media.

Low perception of positive consequences			
Men			
18-39	47%		
40-59		49%	
60 and over			29%
Women			
18-39	61%		
40-59		52%	
60 and over			36%
High perception of positive consequences			
Men			
18-39	71%		
40-59		71%	
60 and over			57%
Women			
18-39	75%		
40-59		75%	
60 and over			54%

(These percentages are based on subgroups, in descending order, of 76, 71, 70, 183, 185, 151, 121, 94, 37, 142, 125, 39.)

Informational Use of Radio

Use of radio for its informational content and for its music/entertainment content are considered separately, since respondents could be high or low on both uses.

Individual correlations (Table 2) and multiple regression coefficients (Figure 14) both indicate that age, number of organizational memberships, sex, and perception of practical education in the media are the strong predictors of informational use of radio. Even the order of predictive strength is the same, except that sex and number of organizational memberships are tied in Figure 14.

Since age is by far the best predictor, we show in Table 16 its relationship to informational use of radio. The oldest group is about half again as likely as the youngest group to use the radio for information. A comparable relationship was found in the San Mateo data. A ratio of 1.5:1 is not striking, but its significance is brought into focus by the corollary finding (from San Mateo, since amount of use was not asked in Fresno) that overall radio use declines with age.

Figure 14. Significant partialled predictors of use of radio for information.

+ or - *t* value of predictor's partial regression coefficient	Predictors in rank order	*p* value
Values above 6.0	Age (7.4)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
	Number of organizational memberships (4.5) Sex (-4.5)	
4.4		
	Perception of practical education in the media (4.3)	
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
3.0		
2.8		
2.6		.01
2.4		
		.02
2.2		
	Achievement motivation (2.1)	
2.0		.05

Table 16. Per cent reporting informational use of radio by age.

Age group 18-39	44%
Age group 40-59	62%
Age group 60 and over	65%

(These percentages are based on subgroups, in descending order, of 522, 475, 297.)

Music/Entertainment Use of Radio

Both in Table 2 and in Figure 15, age is really all by itself as a predictor of radio use for music and entertainment. Figures 14 and 15 show behaviors that are strongly related to life cycle: music/entertainment listening among the younger respondents and informational listening among the older.

Table 17 shows that respondents below 40 are more than twice as likely as respondents above 40 to report listening to the radio for music and entertainment. There is overlap, of course, in these reported uses, but radio's two distinct audiences emerge in this analysis as a factor to be considered, for example, in any plan to use the radio for information campaigns.

Figure 15. Significant partialled predictors of use of radio for music and entertainment.

Values above 6.0	Age (-10.3)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		.001
3.2		
3.0		
2.8		
2.6		.01
2.4	Perception of positive consequences from new media (2.4)	.02
2.2	Perception of practical education in the media (2.2)	
2.0		.05
+ or - *t* value of predictor's partial regression coefficient	Predictors in rank order	*p* value

Table 17. Per cent reporting music/entertainment use of radio by age.

Age group 18-39	71%
Age group 40-59	57%
Age group 60 and over	32%

(These percentages are based on subgroups, in descending order, of 522, 475, 297.)

Use of "Serious" Television Programs

Respondents were asked to name five programs they watched in the past week. For this analysis all serious programs were first assigned categories: special news, travel, documentary, education, drama (e.g., Hallmark Hall of Fame), music (e.g., Bell Telephone Hour), and religious. It was intended that each category would be analyzed separately, but frequencies of response were too low for such analyses to be meaningful. Therefore each respondent was assigned a summary score from 0 to 7, depending on the range of categories in which he mentioned at least one program.

Since television is a curious medium anyway, perhaps it is appropriate that only psychological predictors appear in Figure 16. Various social predictors that rank fairly high in Table 2 disappear from Figure 16 under partialling. The highest partialled predictor, perception of practical education in the media, seems as appropriate here as it did, for instance, as third-ranked predictor both of newspaper use and of magazine use.

The trends in Table 18 suggest a happy interpretation, in view of our initial interest in achievement motivation as a predictor. Perception of practical education in the media contributes strongly to serious television viewing, but it also specifies what the effect of achievement motivation will be. Among those who perceive that the media *do* offer practical education, achievement motivation makes more of a difference. If the trends were somewhat more sharply contrasted, we would say that such perception is a *necessary* condition for the achievement-motivated person's viewing of serious television programs.

These results parallel those of Schramm *et alia* (1963) and Rees (1967).

Figure 16. Significant partialled predictors of television use, number of categories of serious programs mentioned.

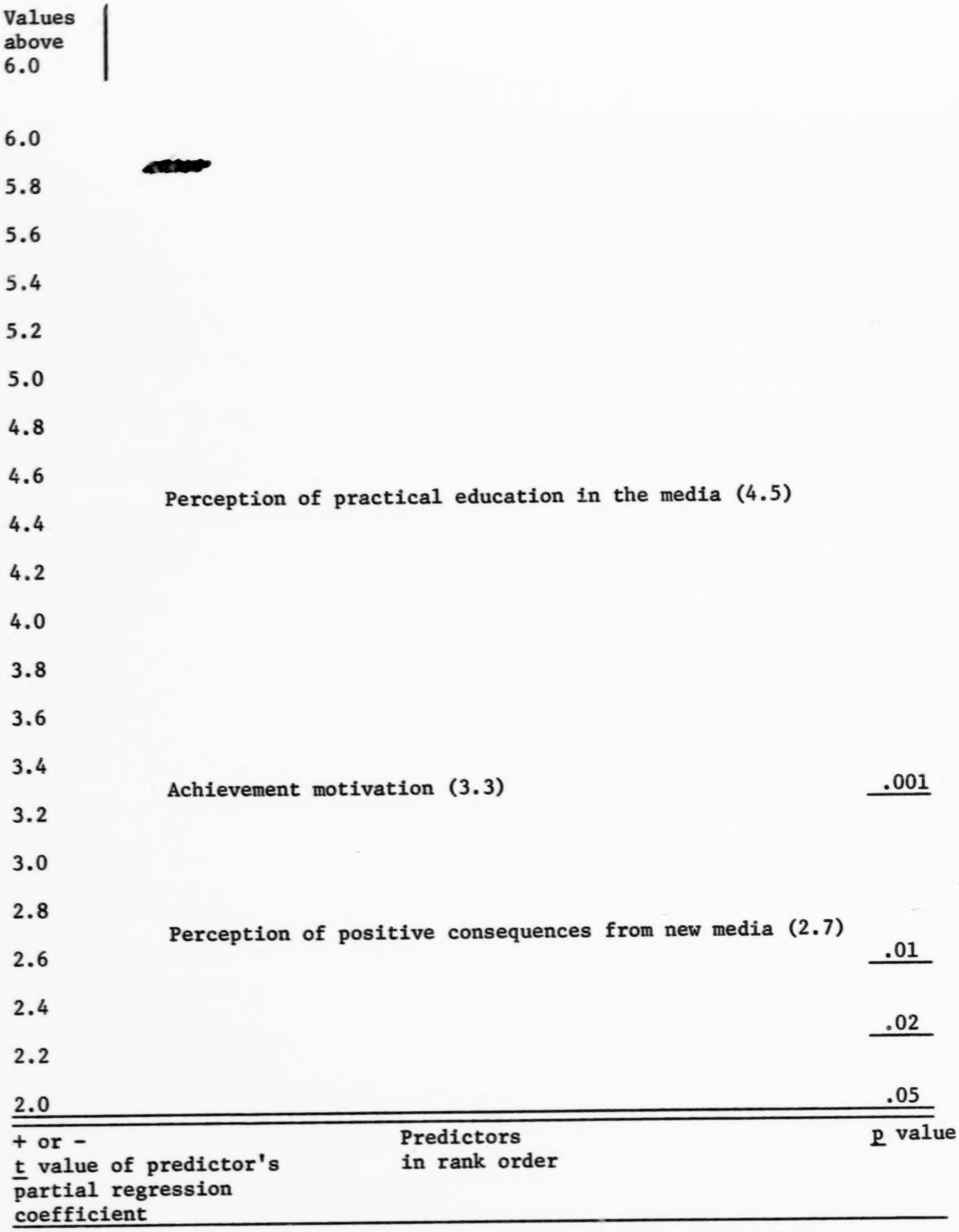


Table 18. Per cent of serious television program "mentions"* by achievement motivation and perception of practical education in the media.

Low perception of practical education			
Low achievement motivation	10%		
Medium achievement motivation		9%	
High achievement motivation			22%
High perception of practical education			
Low achievement motivation	18%		
Medium achievement motivation		29%	
High achievement motivation			38%

(These percentages are based on subgroups, in descending order, of 369, 171, 148, 272, 175, 159.)

*It was necessary to tabulate the total number of serious television programs mentioned within each subgroup, although the regression analysis variable was the number of serious programs mentioned per person.

Specific Information Seeking in the Media

Respondents were asked four questions of the general type, "Sometimes we turn to (newspapers, magazines, television, radio) when we want to find out specific things. Can you remember doing this recently -- turning to (a newspaper, a magazine, television, radio) to find some specific information? What were you looking for?" We summed the number of reasonably specific information-seeking responses into an index. Percentage of the sample at each level of the index was: none, 18 per cent; one, 26 per cent; two, 31 per cent; three, 18 per cent; four, 7 per cent.

It is intuitively satisfying that Figure 17 alters the pattern of Table 2 and shows perception of practical education in the media to be the strongest predictor, other predictors "held constant". Without inferring direction of effect, we can say that people are more likely to seek specific information in the media when they perceive the media to be sources of "readily available and practical education". Formal education is not even in the running as a predictor.

There is another direction-of-effect problem in the predictive role of perception of positive consequences from new media -- the "openness to change" attribute. This perception may lead to information seeking, or it may be a consequence, or both.

Table 19 shows a range of high specific information seeking from 34 to 78 per cent. The trends are monotonic and nearly linear.

Figure 17. Significant partialled predictors of specific information seeking in the media.

+ or – t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Perception of practical education in the media (7.3) Perception of positive consequences from new media (7.2)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0	Number of organizational memberships (4.0)	
3.8		
3.6		
3.4		
	Achievement motivation (3.3)	.001
3.2		
3.0		
2.8		
2.6	Income (2.6)	.01
2.4		
		.02
2.2		
2.0		.05

Table 19. Per cent reporting specific information seeking in two or more media, by perception of practical education in the media and perception of positive consequences from new media.

Low perception of practical education			
Low perception of positive consequences	34%		
Medium perception of positive consequences		52%	
High perception of positive consequences			71%
High perception of practical education			
Low perception of positive consequences	52%		
Medium perception of positive consequences		67%	
High perception of positive consequences			78%

(These percentages are based on subgroups, in descending order, of 312, 255, 121, 156, 252, 198.)

Impersonal Information Seeking

Questions of the previous section were media-specific; they asked whether information seeking had occurrred in four media. In another part of the Fresno interview we asked about information by topic -- public affairs, vocation, leisure time, etc. In these questions the respondent was free to mention any information source, from books and billboards to other people and simple "observation of what's going on". For this analysis we coded each person's tendency to mention impersonal sources, interpersonal sources, and no sources at all.

An index of impersonal information-seeking tendency is the sum of times each person mentioned books, magazines, newspapers, radio, television, pamphlets, etc. across the range of topics. The percentage of respondents at each index level was: none, 13 per cent; one, 14 per cent; two, 21 per cent; three, 19 per cent; four, 18 per cent; five or more, 15 per cent.

In a pattern similar to Figure 17, the two perception predictors stand far above the predictor in third place. (Since the perception predictors are often close together in the "partialled predictor profiles", it should be noted that they are moderately related to each other, .29.) Education stands in third place, perhaps because of respondents' opportunity to mention books and visits to the library.

Table 20 shows that people low on both perceptions are quite low in reporting impersonal information sources, 24 per cent. On the other hand, high perception of positive consequences seems by itself to be a sufficient condition for this behavior, 72 and 73 per cent.

Figure 18. Significant partialled predictors of impersonal information seeking.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Perception of positive consequences from new media (8.3) Perception of practical education in the media (6.3)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6	Education (4.6)	
4.4		
4.2		
4.0		
3.8		
3.6		
	Age (3.5)	
3.4		
		.001
3.2		
3.0		
2.8		
2.6		.01
2.4		
		.02
2.2		
	Number of organizational memberships (2.1) Marital status (2.1)	
2.0		.05

Table 20. Per cent reporting an impersonal information source in three or more topic areas, by perception of practical education in the media and perception of positive consequences from new media.

Low perception of practical education			
Low perception of positive consequences	24%		
Medium perception of positive consequences		54%	
High perception of positive consequences			72%
High perception of practical education			
Low perception of positive consequences	44%		
Medium perception of positive consequences		63%	
High perception of positive consequences			73%

(These percentages are based on subgroups, in descending order, of 312, 255, 121, 156, 252, 198.)

Interpersonal Information Seeking

An index of interpersonal information-seeking tendency is the sum of times each person mentioned other people as information sources across a range of topics (see p. III-57). The percentage of respondents at each index level was: none, 56 per cent; one, 29 per cent; two, 11 per cent; three, 3 per cent; four, 1 per cent.

There is a striking coincidence in Figure 19. Interpersonal information seeking, the only behavior in this set of 25 that emphasizes the role of other people, is most strongly predicted by number of organizational memberships, the only predictor (in addition to marital status, of course) that mentions other people at all. (Marital status is a barely significant negative predictor -- married people are slightly less likely to consult other people, spouses included.)

Table 21 shows the supplementary role of income. In each of the three organizational-membership subgroups, there is a more marked increase in use of interpersonal information sources from low to middle income groups than from middle to high. Those who are high in organizational memberships, even with low income, and those who have middle income or more, even the non-joiners, are at least halfway up the percentage scale in mentioning interpersonal information sources.

Figure 19. Significant partialled predictors of interpersonal information seeking.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8	Number of organizational memberships (5.8)	
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2	Income (4.2)	
4.0		
3.8		
3.6		
	Perception of positive consequences from new media (3.5)	
3.4		
		.001
3.2	Perception of practical education in the media (3.2)	
3.0		
2.8		
2.6		.01
	Achievement motivation (2.5)	
2.4		
		.02
2.2		
	Marital status (-2.1)	
2.0		.05

Table 21. Per cent reporting an interpersonal information source in one or more topic areas, by income and number of organizational memberships.

No organizational memberships			
Less than $5,000 per year	25%		
$5,000 - $10,000		44%	
Over $10,000			46%
One organizational membership			
Less than $5,000	35%		
$5,000 - $10,000		49%	
Over $10,000			59%
Two or more organizational memberships			
Less than $5,000	46%		
$5,000 - $10,000		59%	
Over $10,000			63%

(These percentages are based on subgroups, in descending order, of 298, 216, 63, 139, 174, 59, 82, 154, 109.)

Total Participation in Adult Education

A careful inventory was taken of ways in which a respondent might have received instruction during the previous five years. Specific questions concerned evening classes, lectures, correspondence courses, group discussions, television, on-the-job training, private lessons, and self-study. Thirty-nine per cent of the sample had taken part in no forms of adult education; the other 61 per cent ranged from one to six activities per person.

Partialling of predictors of this behavior considerably changes the pattern of Table 2. Age, not perception of positive consequences, is the strongest partialled predictor, by a wide margin. Under partialling, education falls far below the second place it occupies in Table 2.

The importance of age in this analysis corroborates much previous research, including our own San Mateo data. Johnstone and Rivera (1965) report that the median age of adult education participants in their national sample was more than six years younger than the median age of the sample as a whole.

In Table 22 we see the ability of the two perception predictors to specify the percentage range in which age will exercise its influence. For example, among those who are low in both perceptions the range in participation by age is 53 per cent to 18 per cent, while among those who are high in both perceptions the participation range by age is 87 per cent to 56 per cent -- non-overlapping ranges, in spite of age's predictive dominance. In other words, although age is the strongest partialled predictor, an older group with one set of psychological dispositions participates more than a younger group with opposite psychological dispositions.

Figure 20. Significant partialled predictors of adult education, all courses

+ or - *t* value of predictor's partial regression coefficient	Predictors in rank order	*p* value
Values above 6.0	Age (-9.2)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0	Perception of positive consequences from new media (5.0)	
4.8		
4.6	Perception of practical education in the media (4.6)	
4.4		
4.2		
4.0		
	Number of organizational memberships (3.9)	
3.8		
3.6		
	Sex (-3.5)	
3.4		
		.001
3.2		
	Education (3.1)	
3.0		
2.8		
	Achievement motivation (2.7)	
2.6		.01
2.4	Occupation (2.4)	
		.02
2.2		
2.0	Income (2.0)	.05

Table 22. Per cent participating in one or more adult education activity in the past five years, by age, perception of practical education in the media, and perception of positive consequences from new media.

Low perception of practical education	
Low perception of positive consequences	
18-39	53%
40-59	35%
60 and over	18%
Medium perception of positive consequences	
18-39	75%
40-59	69%
60 and over	37%
High perception of positive consequences	
18-39	89%
40-59	73%
60 and over	70%
High perception of practical education	
Low perception of positive consequences	
18-39	61%
40-59	58%
60 and over	33%
Medium perception of positive consequences	
18-39	82%
40-59	68%
60 and over	46%
High perception of positive consequences	
18-39	87%
40-59	84%
60 and over	56%

(These percentages are based on subgroups, in descending order, of 103, 105, 104, 113, 90, 52, 66, 45, 10, 46, 52, 58, 103, 101, 48, 91, 82, 25.)

Participation in Vocational Adult Education

This behavior and the two that follow are subclassifications of the full set of adult education participation responses. Vocational instruction is difficult to distinguish from liberal arts and arts/crafts instruction in many cases -- for example, many mathematics courses are on the boundary between vocational instruction and liberal arts instruction, and many of this country's "vanishing trades" are now being taught as arts/crafts courses for personal satisfaction (e.g., leatherwork). We coded as vocational instruction those courses that had strong utility in contemporary business and industry.

Figure 21 shows again that patterns of Table 2 will be upset by partialling. Education, the strongest predictor of vocational adult education participation in Table 2, falls to eighth place under partialling, while age climbs from fifth place to first. Occupation holds onto its second place in both analyses, reaching here the highest level of predictive strength that it achieves in any partialled analysis.

Table 23 shows that occupation makes more of a difference in participation among the young and middle-aged than among the old. Those over 60 may in fact be taking these courses for personal satisfaction rather than vocational advancement. The overall percentage range is quite large; we can say that every second respondent in the young group, in white-collar-or-higher occupations, participated in vocational adult education, while for the oldest blue-collar group the ratio is one in ten.

Figure 21. Significant partialled predictors of participation in vocational adult education.

+ or − *t* value of predictor's partial regression coefficient	Predictors in rank order	*p* value
Values above 6.0		
6.0		
5.8		
5.6		
5.4		
	Age (-5.3)	
5.2		
5.0		
4.8		
	Occupation (4.7)	
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
	Perception of positive consequences from new media (3.1)	
3.0		
	Sex (-2.9)	
2.8	Marital status (-2.8)	
2.6	Perception of practical education in the media (2.6)	.01
2.4	Income (2.4)	
	Education (2.3)	.02
2.2		
2.0		.05

Table 23. Per cent participating in vocational adult education, by age and occupation.

Blue collar, other			
18-39	30%		
40-59		16%	
60 and over			10%
White collar, managerial, professional			
18-39	55%		
40-59		49%	
60 and over			22%

(These percentages are based on subgroups, in descending order, of 295, 261, 194, 227, 214, 103.)

Participation in Arts/Crafts Adult Education

This aggregation of adult education courses, from wood shop to art studio, is a man's domain by a ratio of at least three to one. Sex and age both retain their predictive places established in Table 2. Occupation stands in a weak third place (white collar/managerial/professional more likely to participate than blue collar).

The percentage range in Table 24 is only 33 per cent, but within this range we can say that young men are twelve times more likely than older women to have taken these courses.

Figure 22. Significant partialled predictors of participation in arts and crafts adult education.

Values above 6.0	Sex (-10.3) Age (-6.4)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
	Occupation (3.1)	
3.0		
2.8		
2.6		.01
2.4		
		.02
2.2		
	Number of organizational memberships (2.1)	
2.0		.05
+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value

Table 24. Per cent participating in arts and crafts adult education, by sex and age.

Men			
18-39	36%		
40-59		28%	
60 and over			7%
Women			
18-39	10%		
40-59		8%	
60 and over			3%

(These percentages are based on subgroups, in descending order, of 197, 165, 107, 325, 310, 190.)

Participation in Liberal Arts Adult Education

Adult education is a vital and diverse activity in America. Many student groups are active for different reasons, from Americanization classes to Great Books discussions to preparation for motherhood. Figures 21, 22, and 23 show how we could be misled if we accepted the overall pattern of Figure 20 as representative of all adult education activities. We find in liberal arts adult education that age is no longer in the first rank of predictors -- older people do enroll in liberal arts instruction. Furthermore, vocational and arts/crafts instruction are primarily male activities, while liberal arts instruction enrolls nearly twice as many women as men.

Formal education has little predictive strength, but education's companion, perception of positive consequences (as strongly associated with education in Table 1 as is income with occupation), is in second place. In fact, a relationship is implied in some analyses (e.g., use of reference books, viewing of serious television programs, participation in adult education): formal education may create a certain attitude, an openness to change, a tendency to impute positive consequences to change. (Other forces may create the same attitude, also.) It seems to be this attitude, and not formal education *per se*, that leads to additional seeking of information through adult education and other means. If the attitude has not been established, even a great amount of formal education may not predict these high-yield forms of information seeking.

Figure 23. Significant partialled predictors of adult education, liberal arts courses.

Values above 6.0	Sex (7.1)	
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
	Perception of positive consequences from new media (4.9)	
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
	Perception of practical education in the media (3.7)	
3.6		
3.4		
		.001
3.2		
	Number of organizational memberships (3.1)	
3.0		
2.8		
	Age (-2.7)	
2.6		.01
2.4	Achievement motivation (2.4)	
		.02
2.2		
2.0	Education (2.0)	.05
+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value

Table 25. Per cent participating in liberal arts adult education, by sex and perception of positive consequences from new media.

Men			
Low perception of positive consequences	13%		
Medium perception of positive consequences		23%	
High perception of positive consequences			33%
Women			
Low perception of positive consequences	23%		
Medium perception of positive consequences		45%	
High perception of positive consequences			57%

(These percentages are based on subgroups, in descending order, of 121, 183, 165, 347, 324, 154.)

Attendance at Evening Classes and Lectures

We shift from adult education subject matter to the instructional setting. The London-Wenkert study (1964) of "obstacles to blue-collar participation in adult education" alerts us to an occupational or even class bias in attendance at evening classes at lectures. We saw in Figure 21 and Table 23 that vocational adult education, a path toward occupational advancement, is the province of white-collar/managerial/professional respondents. In the present analysis, when we combine subjects of study but restrict ourselves to the classroom and lecture hall (omitting correspondence courses, television instruction, self-study, etc.), we find that formal education (= number of years spent in classrooms) joins with age in predicting the behavior. Occupation and number of organizational memberships, both indicative of social class in America, are also highly significant predictors, however.

The variables at issue in "obstacles to blue-collar participation" are an out-of-place feeling in an upper-middle-class institution, avoidance of negative reinforcement, and rejection of the achievement ethic. We see few traces of these factors in the present analysis. Instead we seem to see motivation (younger people perceiving the instrumental rewards of further schooling) and habituation (those who have already spent many years in classrooms do not hesitate to keep going).

Table 26 shows that the percentage range in attendance at evening classes and lectures is from *ca*. 10 per cent among older people with no college background to 74 per cent among young college graduates.

Figure 24. Significant partialled predictors of attendance at evening classes and lectures.

+ or − t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0	Age (-6.2)	
6.0		
5.8		
5.6		
5.4		
5.2		
	Education (5.1)	
5.0		
4.8		
4.6		
4.4		
4.2		
4.0	Perception of practical education in the media (4.0)	
	Number of organizational memberships (3.9)	
3.8		
3.6	Occupation (3.6)	
3.4		
		.001
3.2		
3.0		
	Perception of positive consequences from new media (2.9)	
2.8		
2.6		.01
2.4		
	Achievement motivation (2.3)	.02
2.2		
2.0	Marital status (-2.0)	.05

Table 26. Per cent attending evening classes and lectures, by age and education.

Less than high school graduate			
18-39	26%		
40-59		19%	
60 and over			12%
High school graduate			
18-39	38%		
40-59		38%	
60 and over			3%
Some college			
18-39	63%		
40-59		52%	
60 and over			30%
College graduate			
18-39	74%		
40-59		63%	
60 and over			39%

(These percentages are based on subgroups, in descending order, of 133, 201, 184, 160, 115, 37, 161, 105, 43, 68, 54, 33.)

Adult Education through Self-Study

Following our curiosity about "obstacles to participation" in formal adult education, as discussed by London and Wenkert (1964), we counterposed self-study against attendance at evening classes and lectures, to learn whether subgroups not taking advantage of one mode of instruction were using the other.

As it happens, self-study is not very predictable. Figure 25 shows that formal education and its companion attribute, perception of positive consequences, join with sex in a predictor triad of only modest strength. It is as though self-study, as a low-cost behavior that anyone can begin, given the impulse, is distributed almost randomly through the population. Perhaps it is significant that the strongest predictor of self-study is psychological rather than social. Whom the impulse strikes, studies.

According to Table 27, the percentage range of respondents reporting self-study, from low to high perception of positive consequences, is only 19 per cent to 45 per cent. This is a case in which the predictors are not powerful in dividing the sample into groups very low and very high on the behavior.

Figure 25. Significant partialled predictors of adult education, reported self-study.

+ or - t value of predictor's partial regression coefficient	Predictors in rank order	p value
Values above 6.0		
6.0		
5.8		
5.6		
5.4		
5.2		
5.0		
4.8		
4.6		
4.4		
4.2		
4.0		
3.8		
3.6		
3.4		
		.001
3.2		
	Perception of positive consequences from new media (3.1)	
3.0	Education (3.0) Sex (-2.9)	
2.8		
2.6		.01
2.4		
	Achievement motivation (2.3) Age (-2.3)	.02
2.2		
2.0		.05

Table 27. Per cent reporting self-study, by perception of positive consequences from new media.

Low perception of positive consequences	19%
Medium perception of positive consequences	35%
High perception of positive consequences	45%

(These percentages are based on subgroups, in descending order, of 468, 507, 319.)

DISCUSSION

Behaviors with Similar Predictor Profiles

Perhaps the best way to synthesize our findings concerning the 25 seeking/use behaviors is to look for groups with similar predictor profiles. "Similar" has to be qualified: even when we group on the basis of strongest and second-strongest predictor, no more than three seeking/use behaviors fall in any one group. We should begin, then, with behaviors sharing the same strongest predictor only.

Two such groups contain six behaviors each. They are determined by the life-cycle predictors, age and sex. Those behaviors best predicted by age are:

Total participation in adult education (youth higher)
Adult education, vocational courses (youth)
Adult education, evening classes (youth)
Use of radio for music and entertainment (youth)
Use of radio for information (age higher)
Readership of *Readers' Digest* (age)

Young adults are more likely to participate in adult education in general and in vocational courses and evening classes in particular. However, they use radio for entertainment. With increased age, adults (in general) are participating much less in adult education but are using radio more as a source of information. Use of radio and *Readers' Digest* among older adults may indicate a preference for less effortful sources that cover many topics. Certainly the *kind* and *depth* of information needed by the two age groups will differ, and therefore source appropriateness will also.

Those behaviors best predicted by sex are:

Readership of fiction books (women higher)
Readership of home/garden magazines (women)
Readership of fashion magazines (women)
Readership of home and family magazines (women)
Adult education, liberal arts courses (women)
Adult education, arts and crafts courses (men)

The five behaviors in which women are higher remind us of functions traditionally associated with women in this society -- especially family care, home care, and the transmission of culture.

Education best predicts four behaviors:

Readership of magazines in general
Readership of newsmagazines
Readership of books
Recency of last visit to public library

All of these, of course, increase with education. All require facility with print media, a behavior shaped by formal schooling.

One behavior that might seem to belong in the above group is readership of newspapers. Income is the best predictor of newspaper readership, closely followed by education.

Only two variables in these data, one predictor and one behavior, suggest the importance of other people in our lives. Of these two variables, the social predictor, number of organizational memberships, best predicts the behavior, interpersonal information seeking.

All three of the psychological predictors are important in grouping similar behaviors. Perception of positive consequences from new media is the strongest predictor of:

Use of reference books
Impersonal information seeking
Adult education, self-study

This group is an intuitively valid one. A favorable attitude toward new media may result from, and in turn produce more, in-depth use of existing media -- in other words, stimulus generalization from the familiar to the unknown.

The group of behaviors best predicted by perception of practical education in the media is an extremely interesting one. It includes:

Readership of Life
Television use: serious programs
Specific information seeking in the media

If it is true that this predictor creates a "path", in the Lewinian sense (1936), then these behaviors are well-grouped. Each involves turning to the media for "practical education".

The final psychological variables, achievement motivation, *predicts readership of non-fiction* books. Making an exception to our strongest-predictor rule, we find that the viewing of serious television programs has achievement motivation as its second strongest predictor. While the multiple regression analysis has shown that other predictors are often stronger than achievement motivation when simultaneous controls are applied, it has revealed a certain strength in the variable, perhaps one to be investigated further.

Other approaches to predictor-profile similarity. When we attempt to match profiles on more than one predictor, natural groupings do not appear. It is the exception rather than the rule, for example, that readership of magazines and books have the same strongest and second-strongest predictors, education and sex.

We can get around idiosyncrasy by grouping predictors in the classes with which we began: life-cycle, life-style, and psychological. The life-cycle predictors, age and sex, are ascriptive; the person does not choose them. All remaining social predictors represent achievement or its absence; these are states that the person chooses for himself -- much or little education, high or low income, etc.

If we then inspect predictor profiles to determine which of the classes of predictors is strongest and which is second strongest, interpretable groups are seen. For example, behaviors predicted first by life-style and secondly by life-cycle are:

Readership of magazines
Readership of books
Recency of last visit to public library

While behaviors predicted by the life-style/psychological pairing are:

Readership of newspapers
Readership of newsmagazines
Interpersonal information seeking

And behaviors predicted by the converse of this combination, psychological/life-style, are:

Readership of *Life*
Readership of non-fiction books
Specific information seeking in the media
Impersonal information seeking
Adult education, self-study

A more refined analysis of behavior groupings might involve either the direct correlation of behaviors or the correlation of predictor profiles (a sort of canonical correlation). Direct correlation of behaviors would be based upon the combination of behaviors reported by each respondent; behaviors that exclude each other as "functional equivalents" (an example might be the reading of newspapers or newsmagazines but not both) would be correlated negatively or not at all.

The correlation of predictor profiles would give us a sensitive measure of the extent to which behaviors really do have predictors in common. Factor analysis or cluster analysis of the resulting correlation coefficients would reveal patterns in seeking/use behaviors.

We have not made these additional analyses because we have not settled on a basic predictor set that can be found in other data. Replication is especially needed when factor analysis is allowed to suggest structure.

Utility of These Findings

Findings on information seeking and media use have both practical and theoretical utility.

No single data set should be taken as a basis for policy formation or communication strategy, but related sets of findings may have such practical interpretations as:

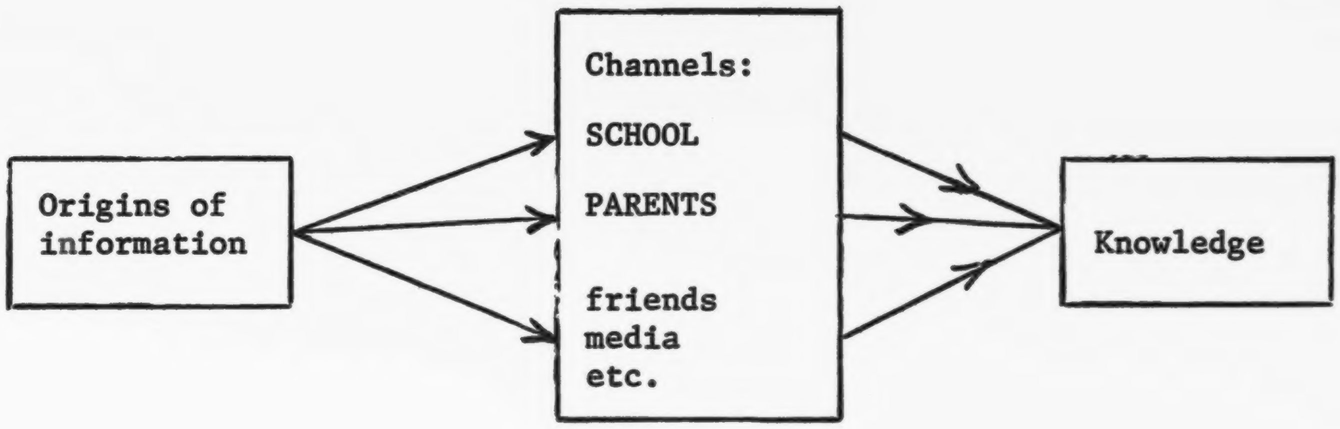
1. If one has a target audience but no commitment to a medium or institution, then predictor profiles can be studied to discover the seeking/use behaviors on which the target audience "peaks". For example, if the target audience consists of older, married women, Figure 6 shows that such an audience is distinguished by readership of home/garden magazines, while Table 8 shows that not all such women, and only 17 per cent of all women, exhibit the behavior. One could reach more of the target audience, but at much greater expense, through television, even though the audience does not "peak" on that behavior.

2. If one has a commitment to a medium, then predictor profiles reveal attributes of the audience being reached. Such institutions as adult education and the public library have sharply profiled audiences.

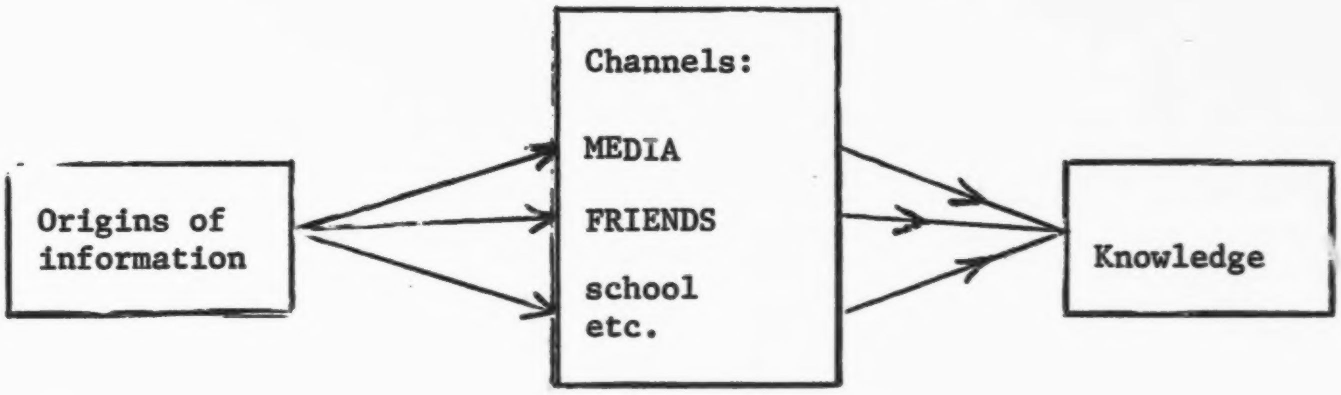
If the obtained audience does not match intention, institutional and content changes may be in order.

On the theory side, we observe that social communication theory is a modest collection of paradigms and models. The theoretical import of findings may only be improved prediction of an end product, such as (for these findings) public knowledge.

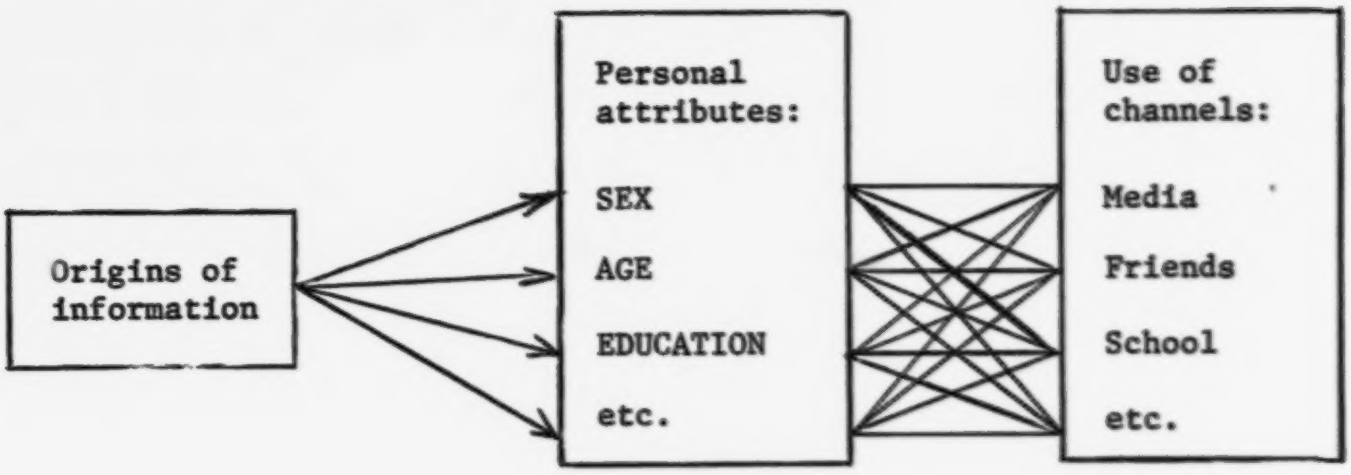
Schramm and Wade (in preparation) have found that knowledge level is correlated with media use (unfortunately, they lacked data on participation in adult education and other information seeking). Thus, if we postulate for children this flow of information and growth of knowledge:


Origins of information
Channels:
SCHOOL
PARENTS
friends
media
etc.
Knowledge

then we postulate for adults:


Origins of information
Channels:
MEDIA
FRIENDS
school
etc.
Knowledge

The crucial role of channels leads us next to the study of differential use of channels. That is, we are led to the study of seeking/use behaviors and their predictors.



All three classes of predictors in this analysis -- life-cycle, life-style, and psychological -- help us to understand differential use of channels through which information passes on its way to becoming knowledge.

Observations about this Analysis Model

We said on page I-5 that we prefer to elaborate a simple model on the basis of its own performance. Twenty-five multiple regressions later, what should be said about linear multiple regression as a statistical model for our predictor-assessment task? Perhaps the following:

1. The predictor profiles, individually and in sets, have face validity. Education, sex, age, and other predictors hold sway in appropriate situations; they predict the behaviors they should. However, face validity is a necessary but not sufficient condition for continuing to use a model. Social scientists have a gift for making sense of findings and patterns *post hoc*, and that's what face validity comes down to.

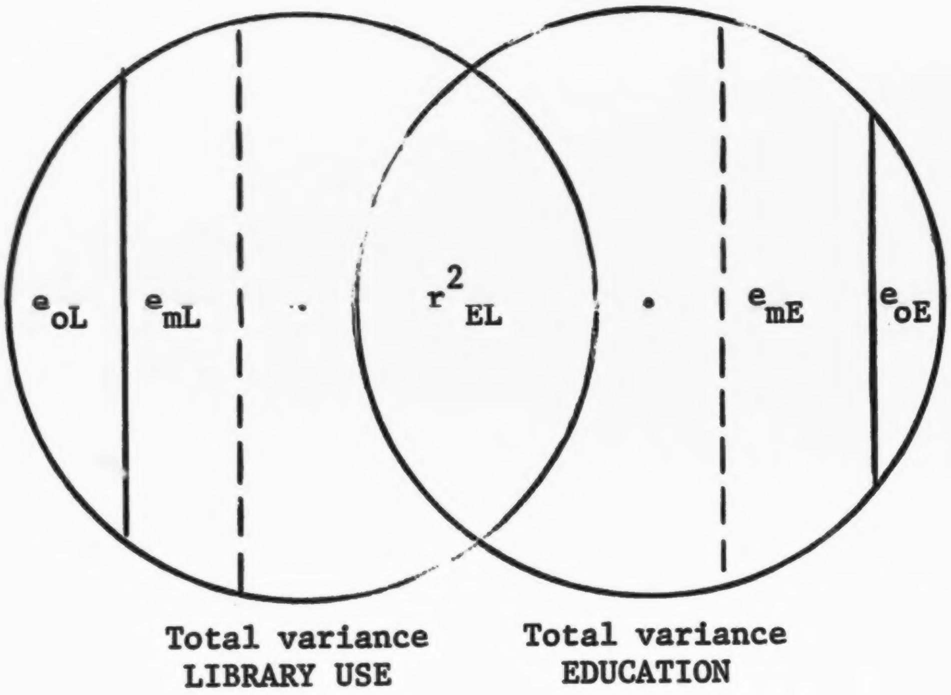
2. Of the 35 variables in our analysis, virtually none meets the univariate assumptions of product-moment correlational analysis. Distributions are skewed, bimodal, and aggregated in too few intervals for the most sensitive analysis.

3. Taken in pairs and sets, the variables often interact in ways that drive numbers of cases away from the regression line or plane. Consider, for instance, the interaction between education and age in predicting library use (Table 14).

4. For several reasons -- some involving the linear model, others involving measurement error prior to analysis -- variance accounted for in each seeking/use behavior is not large. For example, the multiple correlation of 10 predictors with public library use is .51; that is, only 26 per cent of the variance in public library use has been accounted for. Some error variance is inevitable because of the linear model, according to Table 14. There is no way for the regression coefficient of age to shift from negative to positive only in the highest educational subgroup.

Other error variance is attributable to measurement itself. Public library use is quite seasonal -- an activity of different people at different times of the year. Our data were collected in June and July; heavy users "within the past month" might include vacationers in search of leisure reading and adult students in search of course-relevant reading. An adult student at the college level might use a college library, however. In other words, the same question asked in a different season might draw positive response from a different cross-section of the sample, and variation would not be explained by our 10 predictors.

Since the question of analysis model has been raised with the hope of eventual good, better, and best answers, it would be useful to distinguish between the kind of error that will be reduced by a better model and the kind that will not. Using Venn diagrams to represent variance and covariance, we can see two error components in the variance of each variable:



when: each circle represents total variance in a variable;

r^2_{EL} represents the mutually predictable variance or shared variance;

e_o represents observational error, such as the seasonal cycle in library use, plus defects in question phrasing, etc.;

e_m represents model error, the introduction of unpredictable variance by a model that does not completely fit the data, such as a linear model applied to data with curvilinear trends.

In this example, library use is shown with greater observational error than is education, since we assume that education is a reliably measured variable. Education is shown with a large amount of model error, because we know that it interacts with several other variables in a non-additive, sometines non-monotonic manner.

If we now change models, we may hope to diminish the e_m components, but of course the e_o components must remain the same. Reduction of model error may or may not change predictor profiles; it will certainly be accompanied by an increase in shared variance. The apparent power of the predictor set will be greater.

Another statistical procedure, factor analysis, gives us the concept of communality or reliable variance in a variable -- the non-error variance that is "available" to be factored. This is a useful concept; we could also think of the non-error variance in a seeking/use behavior that is "available" to be predicted and the non-error variance in a predictor that provides predictive power.

We do not have reliability measures for our 35 variables. Undoubtedly they range from 1.0 (or thereabouts) for sex, down to .50 or lower for behaviors with time-sampling problems, such as book reading and public library visits. If we had reliability measures, we would re-express all correlations as a function of the reliable variance only -- correction for unreliability, in other words. If reliable variance is represented by s^2_t ("t" for true, following psychometric usage), then we would express shared variance between education and library use as r^2_{EL} / s^2_{tL} and not as r^2_{EL} alone.

We have largely ignored multiple correlations per se in this report because of different amounts of unreliability present in the seeking/use behaviors. A behavior such as book reading, which correlates .36 with the 10 predictors, suffers random and non-random onslaughts of error through our once-only questioning and the brief time period covered. If book reading were measured more reliably (i.e., on two or more occasions, and with two or more methods of inquiry), we would expect the multiple correlation to be higher. Since the strength of a multiple correlation is usually imputed to the predictor set and not to the criterion behavior, we would have the paradox of a strengthened predictor set thanks to improved measurement of the criterion. That is why we prefer to think of shared variance as a function of reliable or "available" variance in the behavior.

Summarizing these observations about the analysis model, it is clear that the data do not meet assumptions governing formal use of linear multiple regression, and that continued use of the model with survey data must be heuristic. We could compute univariate skewnesses and bivariate correlation ratios (etas) to bear out this conclusion, but, having passed that way before (cf. Paisley, 1965; Paisley and Ruggels, 1965), we know that such statistics confirm the obvious; inspection of the data suffices.

Heuristic use of a model is not a new idea. The important difference between formal and heuristic use of a model is that, in the latter, validation must be entirely extrinsic -- hence greater than usual need for convergent findings from other data sets.

Other Analysis Models for Such Data

There are two ways to go in search of other models. We can retain the idea of a prediction equation and become even more precise in specifying its order and composition. This is the direction of nonlinear multiple regression, moving from:

$$x'_1 = b_2x_2 + b_3x_3 + \ldots\ldots + a$$

to: $x'_1 = b_2x^2_2 + b_3x_3 + \ldots\ldots + a$

and to: $x'_1 = b_2x_2^3 + b_2x_2^2 + b_2x_2 + b_3x_3^2 + b_3x_3 \ldots$ etc.

If we are willing to make the model indefinitely precise -- fitted to the particular data set -- then predictive strength will increase correspondingly. However, there is the real possibility that we are fitting a model to error and not to reliable scores. Such a model would fail its first replication test.

In the other direction we exchange the weighted predictive equation for a less constraining set of assumptions. This is the direction of n-way analysis of variance and n-way chi-square. In adopting these nonregression models we lose our ability to specify the exact *nature* of relationships between predictors and the dependent behavior. We retain measures of the *strength* of relationships.

In n-way analysis of variance and n-way chi-square the predictors become classification variables or dimensions, and no metric or order is assumed among the classes of a variable. It is as if, for example, the levels of age no longer implied younger and older but simply different classes. Such attributes as sex, marital status, and occupation are more at home in these models than in multiple regression, because they are inherently nominal or classificatory attributes.

It is easiest to think of these n-way models as extensions of bivariate models. In the case of the analysis of variance, we are exchanging linear product-moment correlation for the correlation ratio, eta. Whereas the former expresses correlation as 1.0 minus the proportion of total variance represented by deviations from a regression line, the latter expresses correlation as 1.0 minus the proportion of total variance represented by deviations from the means of classes, with no order assumed among classes. For the same set of data, eta is always greater than or equal to *r*, and equality results only when the class means happen to be located exactly on the regression line.

In the multivariate case, we have more than one dimension of means, hence more than one apportioning of variance into between-means and within-means components. Three variables give us two unique between-means components and an interaction component. Four variables give three between-means components and four intereactions (i.e., letting A, B, and C represent the dimensions, there is a unique A effect, B effect, and C effect, with the following interactions or joint effects: AB, AC, BC, ABC). Pooling these variance components and dividing by total variance yields a "multiple eta", which could also be construed as 1.0 minus the ratio: residual (within, error) variance/total variance.

In n-way analysis of variance it is not clear how predictors would be ranked on comparative strength. The F-ratio of each dimension would permit rankings comparable to the predictor profiles of this report (i.e., for t, substitute F). However, a predictor may have a small unique effect but enter powerfully into interactions with other predictors. Since an interaction is by definition a joint effect, its predictive power cannot be assigned to either (or any) of the predictors involved. Probably we would want to display on the predictor profile not only the unique effects of predictors but also the interactions that reach significance.

A proposal to use n-way analysis of variance for multivariate predictor assessment requires at least these observations and caveats:

1. The dependent behavior still must have an interval metric, since means and variances are being computed. The technique is robust enough to tolerate some distributional anomalies, such as the positive skewness of our counting metrics (e.g., one magazine, two magazines, three magazines), but extreme skewness and bimodality would lead to heterogeneous variances from one cell to another, and in pooling these within-cells variances into a single residual or error component we are assuming that they come from a single population of variances.

2. Since the significance of F-ratios depends upon degrees of freedom, and degrees of freedom in turn upon the number of classes on each dimension as well as the total number of observations, it would be best either to standardize the number of classes on each predictor's dimension or to compare predictive strengths only in terms of probabilities associated with F-ratios and not the F-ratios themselves.

3. Like any tabulation technique, n-way analysis of variance assigns cases (respondents) to cells, based on particular combinations of attributes. For example, a young male with college education and

white-collar employment would be found in the cell at which those attribute classes intersect, and he can contribute data only to that cell. In such tabulations we find that even 1000 cases are quickly used up, with the result that each cell's mean is based on relatively few cases. With only two classes on each dimension (e.g., male-female, young-old, married-other), three predictors require 8 cells, five predictors 32 cells, seven predictors 128 cells, and ten predictors 1024 cells. Therefore screening of predictors would be necessary to reduce the set, perhaps to six or fewer in the present case. Screening could take the form of one-way analyses of variance; the several most-significant bivariate predictors would continue into multivariate analysis.

4. It is true in all multivariate analysis that, if predictors are positively related to a behavior, their joint predictive strength will be greatest if they are negatively related to each other and least if they are positively related to each other. The following examples show the range of predictive strength determined by correlation between predictors (taken from Paisley, 1964):

If two predictors are each correlated .30 with a behavior,

and are correlated	-.60	with each other, multiple R is	.67
	-.30		.51
	.00		.42
	.30		.37
	.60		.34

If two predictors are each correlated .60 with a behavior,

and are correlated	-.60	with each other, multiple R is	> 1.00
	-.30		1.00
	.00		.85
	.30		.74
	.60		.67

Thus there is reason to hope at least for uncorrelated predictors (the negative-positive-positive combination being quite rare), even in multiple regression analysis. In n-way analysis of variance the need for almost-uncorrelated predictors is crucial, since the distribution of cases into cells follows patterns of correlation between predictors, and highly correlated predictors would overfill some cells and underfill others. As an example, the highest correlation between predictors in Fresno, .51 between education and occupation, would almost certainly leave us with insufficient cases in the "off-cells": high education/ blue collar occupation, low education/professional occupation.

If predictors are highly correlated and still must be retained in the multivariate analysis, it is probably better to make an index combining them, since the extent of their correlation is itself a clue that they are both aspects of the same latent attribute. The "off-cells" problem could be handled by adroit collapsing of categories in the index.

The idea of using n-way chi-square comes from Sutcliffe (1957), who was seeking a frequency-only equivalent to n-way analysis of variance. If we have a behavior expressed only in yes-no terms, such as "did or did not engage in self-study", then n-way chi-square is appropriate. (Counting metrics can also be collapsed into classes for such analysis.) Except for statistical treatment of the dependent behavior, n-way analysis of variance and n-way chi-square are virtually identical. Points 2, 3, and 4 apply equally to n-way chi-square, changing "F ratio" in 2 to "chi-square". Chi-square is even more sensitive to insufficient cases than is the analysis of variance. Otherwise n-way chi-square is the most assumption-free technique available to us.

A variation of all three approaches (multiple regression, n-way analysis of variance, n-way chi-square) is the "stepwise" introduction of predictors based on each predictor's capacity to add strength to an existing set. Starting with the strongest bivariate predictor, other predictors are tested individually, with the predictor adding most strength becoming second predictor in the set, and so on. Stepwise multiple regression is commonplace, and stepwise n-way analysis of variance, an obvious extension, was used by Parker and Paisley (1965). Stepwise n-way chi-square is analogous.

Some stepwise approaches (e.g., Morgan and Sonquist, 1963) not only add additional predictors according to contributed strength, but also create classes within a predictor to maximize that predictor's individual strength. For example, "cutting points" between educational levels might be located so as to maximize contrast in amount of book reading; whether the "some college" people joined "college graduates" or "high school graduates" or remained a separate group would depend on the between-group contrasts in amount of book-reading created by each of these possible groupings.

Some potentially interesting interactions never come to light in the stepwise approach, because the predictors involved are never tested jointly (although one stepwise-multiple-regression program, developed at Michigan, takes account of interactions). And, of course, the stepwise approach does not yield a predictor profile comparable to ours, because earlier-added predictors claim more of the accounted-for variance than they would receive in a simultaneous analysis.

Even among the best minds now turned on the problem of multivariate analysis of survey data, there is no conviction that a single best approach has appeared. Selvin (1967), who continues in the strong tradition of Lazarsfeld and his associates Kendall and Hyman, concludes that multiple regression is the best alternative to the two-variable, three-variable tabular approaches advocated by the Columbia group (cf. Hyman, 1955). The Michigan group, at least as represented by Morgan and Sonquist, favor stepwise nonregression approaches.

Convergent Validation through Replication

To our knowledge, no one has undertaken to compare results of several alternative approaches across two or more data sets. The labor involved is of course enormous. However, both substantive knowledge of seeking/use behaviors and methodological knowledge of the relative merits of multivariate models would be increased by the effort.

In comparing across data sets, it would be necessary to strip away the idiosyncrasies of each set, focusing on the set of behaviors and predictors common to two or more sets. Certain behaviors, such as readership of specific magazines, and certain predictors, such as "perception of practical education in the media", would have to be given up. However, the principle of convergence is most important, and replication-with-compromise is the necessary price unless fresh data collection can be undertaken within the grand design.

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